Cl **83D** *SC* **83D.3.1** *P* **141** *L* **33** # 1

Arumugham, Vinu Cisco

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

Common-mode output return loss (max)

SuggestedRemedy

Change to: Common-mode output return loss (min)

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D.3.1.4.1** *P* **144** *L* **17** # 2

Arumugham, Vinu Cisco

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

This comment applies if the line 15 comment is not accepted.
The reference receiver is used to measure host jitter.

SuggestedRemedy

Change to "The reference receiver is used to measure transmitter jitter."

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D.3.1.4.2** *P* **145** *L* **28** # 3

Arumugham, Vinu Cisco

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

(the difference the lowest and highest values)

SuggestedRemedy

Change to "(the difference of the lowest and highest values)"

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D.3.2.1** *P* **147** *L* **44** # 4

Arumugham, Vinu Cisco

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

Figure 83D-9-Receiver input return loss

SuggestedRemedy

Change to "Figure 83D-9-Receiver differential to common mode return loss"

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D.3.2.2.1** *P* **148** *L* **9** # 5

Arumugham, Vinu Cisco

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

Add footnote for LB.

SuggestedRemedy

b LB = loop bandwidth; upper frequency bound for added sine jitter should be at least 10 times the loop bandwidth of the receiver being tested.

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.1** *P* **158** *L* **20** # 6

Arumugham, Vinu Cisco

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

max or min?

SuggestedRemedy

Change to "Differential output return loss (min)" and "Common to differential mode conversion (min)"

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.1.6.1** *P* **163** *L* **23** # 7

Arumugham, Vinu Cisco

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

Figure description not centered.

SuggestedRemedy

Center it.

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.2** *P* **163** *L* **49** # 8
Arumugham, Vinu Cisco

Comment Type **E** *Comment Status* **X**
Common to differential mode conversion (max)

SuggestedRemedy
Change to "Common to differential mode conversion (min)".

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.3.2** *P* **165** *L* **42** # 9
Arumugham, Vinu Cisco

Comment Type **E** *Comment Status* **X**
Remove unrelated sentence.

SuggestedRemedy
Remove "This output impedance requirement applies to all valid output levels".

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.3.2** *P* **167** *L* **36** # 10
Arumugham, Vinu Cisco

Comment Type **E** *Comment Status* **X**
Reference to Table 88-13. Table does not seem to exist?

SuggestedRemedy
Should it refer to table 83D-4 instead?

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.3.3.1** *P* **168** *L* **47** # 11
Arumugham, Vinu Cisco

Comment Type **E** *Comment Status* **X**
Add a condition to the crosstalk sources.

SuggestedRemedy
Add "Each signal shall use a different PRBS31 seed."

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.4.2** *P* **169** *L* **43** # 12
Arumugham, Vinu Cisco

Comment Type **E** *Comment Status* **X**
Reference to Table 88-13. Table does not seem to exist?

SuggestedRemedy
Should it refer to table 83D-4 instead?

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.4.2** *P* **171** *L* **28** # 13
Arumugham, Vinu Cisco

Comment Type **E** *Comment Status* **X**
width spelling.

SuggestedRemedy
Change "eye with" to "eye width".

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.4.2** *P* **171** *L* **41** # 14
Arumugham, Vinu Cisco

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

SuggestedRemedy
Change "CDRFR" to "CDFR".

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D.3.1** *P* **141** *L* **31** # 15

Arumugham, Vinu Cisco

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

Specify measurement condition.

SuggestedRemedy

Change "Amplitude peak-to-peak (max)" to "Maximum differential pk-pk output voltage", to match line 23.
Condition: Measured with no de-emphasis, using a repeating 8-zeroes, 8-ones test pattern.

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D.3.1.4** *P* **144** *L* **7** # 16

Arumugham, Vinu Cisco

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

Add more conditions on the crosstalk sources.

SuggestedRemedy

Add "All counter-propagating signals shall be asynchronous to the co-propagating signals. Each signal shall use a different PRBS31 seed."

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D.3.1.4.1** *P* **144** *L* **15** # 17

Arumugham, Vinu Cisco

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

Specifying a reference receiver affects measurement quality due to restrictions on pattern type, no. of samples, etc., imposed by the need to post-process the captured waveform.

SuggestedRemedy

Since the eye is open in this case, it may be best to specify jitter measurements without using a reference receiver.
Follow CEI-28G-SR approach.

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.1.6** *P* **161** *L* **12** # 18

Arumugham, Vinu Cisco

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

Add more conditions on the crosstalk sources.

SuggestedRemedy

Add "All counter-propagating signals shall be asynchronous to the co-propagating signals. Each signal shall use a different PRBS31 seed."

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.2.1** *P* **164** *L* **7** # 19

Arumugham, Vinu Cisco

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

Add more conditions on the crosstalk sources.

SuggestedRemedy

Add "All counter-propagating signals shall be asynchronous to the co-propagating signals. Each signal shall use a different PRBS31 seed."

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.3.1** *P* **165** *L* **37** # 20

Arumugham, Vinu Cisco

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

Add MTTFPA statement.

SuggestedRemedy

Add "Maximum BER assumes errors are not correlated to ensure a sufficiently high mean time to false packet acceptance (MTTFPA) assuming 64B/66B coding. Actual implementation of the receiver is beyond the scope of the standard"

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.4.2.1** *P* **170** *L* **52** # 21

Arumugham, Vinu Cisco

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

Add a condition to the crosstalk sources.

SuggestedRemedy

Add "Each signal shall use a different PRBS31 seed."

Proposed Response *Response Status* **O**

Cl **91** *SC* **91.5.2.7** *P* **85** *L* **22** # 22

Marris, Arthur Cadence Design Syste

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

Remove space

SuggestedRemedy

Change:
RS(528, 514).
to:
RS(528,514).

Change:
RS(544, 514).
to:
RS(544,514).

Proposed Response *Response Status* **O**

Cl **83** *SC* **83.1.4** *P* **56** *L* **15** # 23

Marris, Arthur Cadence Design Syste

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

PMA multiplexor is wrong in Figure 83-2. The RS-FEC layer produces 4 FEC lanes from 20 PCS lanes.

SuggestedRemedy

On line 15 change:
PMA (20:4)
to
PMA (4:4)

Proposed Response *Response Status* **W**

[Editor's note: Subclause set to 83.1.4]

Cl **83** *SC* **83.5.6** *P* **59** *L* **48** # 24

Marris, Arthur Cadence Design Syste

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

Annex 83E is for chip-module applications.

SuggestedRemedy

Change to:
Annex 83E, which specifies the CAUI-4 interface for chip-to-module applications.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.6** *P* **100** *L* **5** # 25

Marris, Arthur Cadence Design Syste

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

It is the RS-FEC that does lane re-ordering not the PCS.

SuggestedRemedy

Change to:
as the FEC is capable of receiving the lanes in any arrangement

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D.1** *P* **139** *L* **31** # 26

Marris, Arthur Cadence Design Syste

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

PMA multiplexor is wrong in Figure 83D-1. The RS-FEC layer produces 4 FEC lanes from 20 PCS lanes.

SuggestedRemedy

On line 31 change:
PMA (20:4)
to
PMA (4:4)

Insert additional PMA sublayer above RS_FEC layer:
PMA (4:20)

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.1** *P* **155** *L* **30** # 27

Marris, Arthur — Cadence Design Syste

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

PMA multiplexor is wrong in Figure 83E-1. The RS-FEC layer produces 4 FEC lanes from 20 PCS lanes.

SuggestedRemedy

On line 30 change:
PMA (20:4)
to
PMA (4:4)

Proposed Response *Response Status* **O**

Cl **83** *SC* **83.5.6** *P* **59** *L* **48** # 28

Dove, Dan — AppliedMicro

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

Annex 83E is for chip-module applications.

SuggestedRemedy

Change to:
Annex 83E, which specifies the CAUI-4 interface for chip-to-module applications.

Proposed Response *Response Status* **O**

Cl **83** *SC* **83.5.6** *P* **59** *L* **51** # 29

Dove, Dan — AppliedMicro

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

Question: If PSM4 or CWDM adopted, would we not include the reference into this line?

SuggestedRemedy

If adopted, make necessary inclusion.

Proposed Response *Response Status* **W**

[Editor's note: Page changed from 60 to 59]

Cl **83E** *SC* **83E.5.4.2** *P* **174** *L* **15** # 30

Dove, Dan — AppliedMicro

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

References 83E.3.3.2

SuggestedRemedy

Reference 83E.3.1.3

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.5.4.2** *P* **174** *L* **22** # 31

Dove, Dan — AppliedMicro

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

References 83E.3.3.2

SuggestedRemedy

Reference 83E.3.1.5

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.5.4.2** *P* **174** *L* **22** # 32

Dove, Dan — AppliedMicro

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

Exposing my ignorance, the spec says "The transition time shall be greater than or equal to 9.5 ps." There are many values that would fit that spec yet lead to failure of operation. Am I mis-reading this?

SuggestedRemedy

Reconsider the wording to limit rise-time more clearly. If appropriate, revise all instances and PICs items as required.

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.5.4.3** *P* **175** *L* **42** # 33
Dove, Dan AppliedMicro

Comment Type **ER** *Comment Status* **X**
References 83E.3.1.2

SuggestedRemedy
Reference 83E.3.3.2

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.5.4.4** *P* **176** *L* **12** # 34
Dove, Dan AppliedMicro

Comment Type **ER** *Comment Status* **X**
References 83E.3.1.2

SuggestedRemedy
Reference 83E.3.3.2

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.5.4.1** *P* **174** *L* **32** # 35
Dove, Dan AppliedMicro

Comment Type **ER** *Comment Status* **X**
References 83E.3.3.2

SuggestedRemedy
Reference 83E.3.1.3

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.5.4.1** *P* **174** *L* **40** # 36
Dove, Dan AppliedMicro

Comment Type **ER** *Comment Status* **X**
References 83E.3.3.2

SuggestedRemedy
Reference 83E.3.1.5

Proposed Response *Response Status* **O**

Cl **85** *SC* **85.13** *P* **63** *L* **44** # 37
Dove, Dan AppliedMicro

Comment Type **T** *Comment Status* **X**
Item=CAUI Should that not say CAUI-n?

SuggestedRemedy
If appropriate, change to CAUI-n?

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.1.5** *P* **161** *L* **3** # 38
Dove, Dan AppliedMicro

Comment Type **T** *Comment Status* **X**
Exposing my ignorance, the spec says "The transition time shall be greater than or equal to 10 ps." There are many values that would fit that spec yet lead to failure of operation. Am I mis-reading this?

SuggestedRemedy
Reconsider the wording to limit rise-time more clearly. If appropriate, revise all instances and PICs items as required.

Proposed Response *Response Status* **W**
[Editor's note: Clause changed from 85E to 83E]

Cl **87** *SC* **87.1** *P* **67** *L* **48** # 39
Dove, Dan AppliedMicro

Comment Type **T** *Comment Status* **X**
"fast wake Low Power Idle (LPI) mode" I cannot find a reference to this FWLPI mode. I can find various references to fast wake, fast wake mode, etc. It seems like inconsistent terminology related to fast wake Low Power Idle (LPI) mode.

SuggestedRemedy
Define Deep Sleep and Fast Wake LPI mode in an appropriate definition table/location and then use consistent naming for each.

Proposed Response *Response Status* **O**

Cl **87** *SC* **87.7** *P* **70** *L* **17** # 40

Dove, Dan AppliedMicro

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

I'm not sure I agree with "(e.g., a 40GBASE-LR4 PMD operating at 12.5 km meets the operating range requirement of 2 m to 10 km)."

SuggestedRemedy

Restate: "(e.g., a 40GBASE-LR4 PMD capable of operating on a 12.5 km channel meets the operating range requirement of 2 m to 10 km)."

Proposed Response *Response Status* **O**

Cl **88** *SC* **88.1** *P* **81** *L* **41** # 41

Dove, Dan AppliedMicro

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

"fast wake Low Power Idle (LPI) mode" I cannot find a reference to this FWLPI mode. I can find various references to fast wake, fast wake mode, etc. It seems like inconsistent terminology related to fast wake Low Power Idle (LPI) mode.

SuggestedRemedy

Define Deep Sleep and Fast Wake LPI mode in an appropriate definition table/location and then use consistent naming for each.

Proposed Response *Response Status* **O**

Cl **93** *SC* **93.3** *P* **89** *L* **44** # 42

Dove, Dan AppliedMicro

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

Item=CAUI Should that not say CAUI-n?

SuggestedRemedy

If appropriate, change to CAUI-n?

Proposed Response *Response Status* **O**

Cl **94** *SC* **94.3** *P* **91** *L* **44** # 43

Dove, Dan AppliedMicro

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

Item=CAUI Should that not say CAUI-n?

SuggestedRemedy

If appropriate, change to CAUI-n?

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.1** *P* **93** *L* **48** # 44

Dove, Dan AppliedMicro

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

"fast wake Low Power Idle (LPI) mode" I cannot find a reference to this FWLPI mode. I can find various references to fast wake, fast wake mode, etc. It seems like inconsistent terminology related to fast wake Low Power Idle (LPI) mode.

SuggestedRemedy

Define Deep Sleep and Fast Wake LPI mode in an appropriate definition table/location and then use consistent naming for each.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.7** *P* **100** *L* **40** # 45

Abbott, John Corning Incorporated

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

The RMS spectral width is given as 0.6nm
The spectral character of VCSEL lasers is not well characterized by an RMS spectral width. It consists of 'lines' with a certain spacing.
The models of the effect of spectral width do not necessarily take this into account. Some thought should be given to eventually Improving on RMS spectral width to characterize lasers

SuggestedRemedy

None. Comment is for reference/discussion only. Thanks!

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.8.5** *P* **104** *L* **38** # 46

Anslow, Pete Ciena

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

"the BER specified in Table 95.1.1" should be "the BER specified in 95.1.1"

SuggestedRemedy

Change the cross-reference format to Section thereby removing the spurious text "Table"

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* *L* # 47

Anslow, Pete Ciena

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

Many sections of this draft are making changes to clauses that are also being modified by other projects which are likely to be approved before P802.3bm such as P802.3bk and P802.3bj.

SuggestedRemedy

Keep the base text of the draft in line with the 802.3 standard as modified by these other amendments as they progress. Also, bring any new instances of "CAUI" that are added to these drafts in to the 802.3bm draft with changes to the name as appropriate.

Proposed Response *Response Status* **O**

Cl **69** *SC* **69.1.3** *P* **33** *L* **14** # 48

Anslow, Pete Ciena

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

Now that P802.3bj D2.1 has added a new item g) to this subclause which references CAUI, make appropriate changes to it to account for the change of name from CAUI to CAUI-10.

SuggestedRemedy

Bring the new item g) in to the draft, change CAUI to CAUI-10, and add ten-lane to the name expansion

Proposed Response *Response Status* **O**

Cl **87** *SC* **87.7.3** *P* **73** *L* **14** # 49

Anslow, Pete Ciena

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

The value for the "Power budget (for max TDP)" is missing for 40GBASE-ER4. This should be 18.5 + 2.6 = 21.1 dB

SuggestedRemedy

add the value "21.1" to the cell (in underline font)

Proposed Response *Response Status* **O**

Cl **78** *SC* **78.1** *P* **37** *L* **8** # 50

McDermott, Thomas Fujitsu

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

Need reference either to tables 80-2, 80-2a, and 80-2b and/or clauses 87-1, 88-1, and 89-1 as to which PHYs do and do not have optional EEE deep sleep capability.

SuggestedRemedy

Add reference to appropriate table(s).

Proposed Response *Response Status* **W**

[Editors note: Clause changed from 78.1. to 78, Subclause set to 78.1, Page set to 37 and Line set to 8]

Cl **83** *SC* **83.5.6** *P* **59** *L* **48** # 51

McDermott, Thomas Fujitsu

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

Text refers to annex 83E as CAUI-4 chip-to-chip. Should be CAUI-4 chip-to-module.

SuggestedRemedy

Proposed Response *Response Status* **W**

[Editors note: Clause changed from 83.5. to 83, Subclause set to 83.5.6, Page set to 59 and Line set to 48]

Cl **78** *SC* **78.5** *P* **39** *L* **48** # 52

McDermott, Thomas Fujitsu

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

Table 78-4 "Case 1" and "Case 2" - these have different meanings depending on the particular PHY. There is no text in 802.3az that defines the meaning of Case 1 and Case 2 for 40G and 100G PHYs.

SuggestedRemedy

Define Case 1 and Case 2 for 40G and 100G PHY types.

Proposed Response *Response Status* **W**

[Editors note: Clause changed from 78.1. to 78, Subclause changed from "Table 78-4" to 78.5, Page set to 39 and Line set to 48]

Cl **83E** *SC* **83E.3.1** *P* **158** *L* **17** # 53

Latchman, Ryan Mindspeed

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

Output total jitter max and eye height differential (min) is TBD.
Output jitter specification should be eye width to be consistent with other industry documents

SuggestedRemedy

change Output total jitter (max) to eye width (min) with value 0.46UI
change eye height (min) value from TBD to 95mV
make associated change to TBDs in section 83E.3.1.6

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.1.6.1** *P* **162** *L* **1** # 54

Latchman, Ryan Mindspeed

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

Number of reference equalizer settings for host transmitter are TBD

SuggestedRemedy

change TBD to 9 for host transmitter. Remove note that CTLE coefficients are TBC. Add to Z1/2pi significant digits per below:
8. 31
7.1
5.68
4.98
4.35
3.82
3.43
3
2.67

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.2** *P* **163** *L* **43** # 55

Latchman, Ryan Mindspeed

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

Output total jitter max and eye height differential (min) is TBD.
Output jitter specification should be eye opening to be consistent with other industry documents

SuggestedRemedy

Change Output total jitter (max) to eye width (min) with a value of 0.57UI
Change Eye height TBD to 228mV
make associated change in section 83E.3.2.1

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.2.1.1** *P* **164** *L* **50** # 56

Latchman, Ryan Mindspeed

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

number of reference equalizer settings for module transmitter are TBD

SuggestedRemedy

change TBD to 2 for module transmitter. Remove note that CTLE coefficients are TBC.
Add to Z1/2pi significant digits per below:
8. 31
7.10

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.3.3** *P* **167** *L* **34** # 57

Latchman, Ryan Mindspeed

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

Table 83E–6—Host stressed receiver parameters are TBD. Minimum total input jitter tolerance should be changed to eye width

SuggestedRemedy

Change Minimum total input jitter tolerance to eye width with a value of 0.57UI
Change eye height value from TBD to 228mV
make associated change to section 83E.3.3.3.1 Host stressed receiver test procedure:
...and minimum input jitter tolerance given in Table 83E–6 using the reference receiver...
to
...and eye width given in Table 83E–6 using the reference receiver...

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.4.2** *P* **169** *L* **42** # 58

Latchman, Ryan Mindspeed

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

Table 83E–9—Module stressed receiver parameters are TBD. Minimum total input jitter tolerance should be changed to eye width

SuggestedRemedy

Change Minimum total input jitter tolerance to eye width with a value of 0.46UI
Change eye height value from TBD to 95mV
make associated change to section 83E.3.4.2.1 Module stressed receiver test procedure:
Random jitter and variable gain are adjusted to result in the minimum eye height and minimum
total input jitter tolerance given in Table 83E–9 using the reference receiver.
to
Random jitter and variable gain are adjusted to result in the minimum eye height and eye width given in Table 83E–9 using the reference receiver

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.4.2** *P* **171** *L* **32** # 59

Latchman, Ryan Mindspeed

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

Number of bits to generate CDF is TBD

SuggestedRemedy

change to "Collect sufficient
samples equivalent to at least 4 million bits to allow..."

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.2** *P* **163** *L* **46** # 60

Latchman, Ryan Mindspeed

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

Vertical eye closure measurements and simulations show 6.5dB is overly relaxed, increasing the burden on the host

SuggestedRemedy

change VEC from 6.5dB to 5.5dB

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D.1** *P* **140** *L* **4** # 61
Latchman, Ryan Mindspeed

Comment Type **T** *Comment Status* **X**
CAUI-4 chip-chip channel loss still TBC

SuggestedRemedy
See latchmam_03_0713

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D.3.1** *P* **141** *L* **37** # 62
Latchman, Ryan Mindspeed

Comment Type **T** *Comment Status* **X**
Reference CTLE not needed for DJ and TJ measurements given compliance points

SuggestedRemedy
remove "with reference CTLE" and note b
delete section 83D.3.1.4.1 Reference receiver for transmitter jitter evaluation

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D.3.1** *P* **141** *L* **43** # 63
Latchman, Ryan Mindspeed

Comment Type **T** *Comment Status* **X**
Output waveform TBD

SuggestedRemedy
see latchman_03_0713

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D.3.1** *P* **41** *L* **46** # 64
Latchman, Ryan Mindspeed

Comment Type **T** *Comment Status* **X**
De-emphasis range is TBD

SuggestedRemedy
see latchman_03_0713

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D.3.2** *P* **146** *L* **21** # 65
Latchman, Ryan Mindspeed

Comment Type **T** *Comment Status* **X**
De-emphasis range not a spec for a receiver

SuggestedRemedy
delete from Table 83D–3—CAUI-4 receiver characteristics at TP5a

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D.4** *P* **148** *L* **51** # 66
Latchman, Ryan Mindspeed

Comment Type **T** *Comment Status* **X**
COM parameters and value TBD

SuggestedRemedy
see latchman_03_0713

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.1.1** *P* **94** *L* **40** # 67
Warland, TIm AppliedMicro

Comment Type **T** *Comment Status* **X**
Editor suggests a BER that will result in "error statistics that are sufficiently random" but provides no further guidance. Are we to take a vendor at their word when they say the error statistics are sufficiently random or shall we provide some guidance like the maximum number of consecutive errors or other requirements?

SuggestedRemedy
Provide guidance as to what constitutes sufficiently random error statistics

Proposed Response *Response Status* **W**
[Editors note: Subclause changed from 1.1 to 95.1.1]

Cl **95** *SC* **95.2** *P* **95** *L* **9** # 68

Warland, TIm AppliedMicro

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

". . . the PMA continuously sends four parallel bit streams to the PMD.". This is correct but insufficient. It would be more appropriate to say "The PMA continuously sends four parallel bit streams to the PMD. These four lanes operate synchronously to each other although the streams are not necessarily correlated."

SuggestedRemedy

Change text to "The PMA continuously sends four parallel bit streams to the PMD. These four lanes operate synchronously to each other although the streams are not necessarily correlated."

Proposed Response *Response Status* **W**

Duplicate of comment #69
[Editor's note: Comment Type set to "T", Subclause changed from 2 to 95.2]

Cl **95** *SC* **95.2** *P* **95** *L* **14** # 69

Warland, TIm AppliedMicro

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

". . . the PMA continuously sends four parallel bit streams to the PMD.". This is correct but insufficient. It would be more appropriate to say "The PMA continuously sends four parallel bit streams to the PMD. These four lanes operate synchronously to each other although the streams are not necessarily correlated."

SuggestedRemedy

Change text to: "The PMA continuously sends four parallel bit streams to the PMD. These four lanes operate synchronously to each other although the streams are not necessarily correlated."

Proposed Response *Response Status* **W**

[Editors note: Subclause changed from 2 to 95.2]

Cl **95** *SC* **95.5.1** *P* **97** *L* **16** # 70

Warland, TIm AppliedMicro

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

Figure 95-2 explicitly shows a retimer function. Table 95-1 calls the PMA 'Required' for 100GBASE-SR4. Does this mean that a retimer is always required as part of a 100GBASE-SR4 implementation? Will there ever be a case where the retimer is no longer required or integrated with the PCS layer?

SuggestedRemedy

Remove the text "part of PMA" for the retimer function in figure 95-2

Proposed Response *Response Status* **W**

[Editors note: Subclause changed from 1.1 to 95.5.1]

Cl **95** *SC* **95.5.2** *P* **97** *L* **50** # 71

Warland, TIm AppliedMicro

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

"Higher optical power level in each signal stream shall correspond to tx_bit = one. This can be interpreted to be the logical one or the first bit in the bit stream. Correct to "Higher optical power level in each signal stream shall correspond to tx_bit = logic one"

SuggestedRemedy

Correct to "Higher optical power level in each signal stream shall correspond to tx_bit = logic one"

Proposed Response *Response Status* **W**

[Editors note: Subclause changed from 5.2 to 95.5.2]

Cl **95** *SC* **95.5.3** *P* **98** *L* **6** # 72

Warland, TIm AppliedMicro

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

"Higher optical power level in each signal stream shall correspond to tx_bit = one." This can be interpreted to be the logical one or the first bit in the bit stream

SuggestedRemedy

Correct to "Higher optical power level in each signal stream shall correspond to tx_bit = logic one"

Proposed Response *Response Status* **W**

Since this refers to 95.5.3, the Editor assumes that commenter means rx_bit = one.
[Editor's note: Subclause changed from 5.3 to 95.5.3]

Cl **95** *SC* **95.5.4** *P* **98** *L* **33** # 73

Warland, TIm AppliedMicro

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

Signal detect OK assigned when the input is a compliant 100GBASE-R signal input. While I understand the authors intention, implementers can not be required to check valid signal protocol for 100GBASE-R compliance.

SuggestedRemedy

Suggest changes to reflect a signal at the correct wavelength and operating rate as defined in table 95-6, but not full compliance with 100GBASE-R.

Proposed Response *Response Status* **W**

[Editor's note: Subclause changed from 5.4 to 95.5.4]

Cl **95** *SC* **95.8.1.1** *P* **103** *L* **43** # 74

Warland, TIm AppliedMicro

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

Aggressor patterns are not defined. Suggest changing sentence to "All aggressor lanes are operated as specified and can not contain the same pattern unless an mulit-UI offset is applied between the two patterns".

SuggestedRemedy

Suggest changing sentence to "All aggressor lanes operated as specified and can not contain the same pattern unless an mulit-UI offset is applied between the two patterns".

Proposed Response *Response Status* **W**

[Editor's note: Subclause changed from 8.1.1 to 95.8.1.1]

Cl **78** *SC* **78.1** *P* **37** *L* **11** # 75

Anslow, Pete Ciena

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

The third paragraph of 78.1 as modified by P802.3bj D2.1 and P802.3bm now reads:
"Table 78–1 specifies clauses for EEE operation over twisted-pair cabling systems, twinax cable, and electrical backplanes; for XGMII extension using the XGXS for 10 Gb/s PHYs; and for inter sublayer service interfaces using the XLAUI for 40 Gb/s PHYs and CAUI-10 or CAUI-4 for 100 Gb/s PHYs."
This does not include optical PHYs

SuggestedRemedy

Change to:
"Table 78–1 specifies clauses for EEE operation over twisted-pair cabling systems, twinax cable, electrical backplanes, and optical fiber; for XGMII extension using the XGXS for 10 Gb/s PHYs; and for inter sublayer service interfaces using the XLAUI for 40 Gb/s PHYs and CAUI-10 or CAUI-4 for 100 Gb/s PHYs."

Proposed Response *Response Status* **O**

Cl **87** *SC* **87.7** *P* **70** *L* **20** # 76

Anslow, Pete Ciena

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

The editor's note:
[Editor's note (to be removed prior to publication) - conditions for inter-working between LR4 and ER4 to be added here.]
should be replaced by appropriate text.

SuggestedRemedy

Add text to describe the requirements for interworking between 40GBASE-LR4 and 40GBASE-ER4.

See associated presentation from the SMF Ad Hoc

Proposed Response *Response Status* **O**

Cl **80** *SC* **80.2.3** *P* **43** *L* **28** # 77

Anslow, Pete Ciena

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

The first paragraph of 80.2.3 as modified by P802.3bj D2.1 now reads:
"A Forward Error Correction sublayer is available for all 40GBASE-R and 100GBASE-R copper and backplane PHYs. It is optional for 40GBASE-KR4, 40GBASE-CR4 and 100GBASE-CR10 PHYs and mandatory for 100GBASE-CR4, 100GBASE-KR4 and 100GBASE-KP4 PHYs."
This text neeeds to be modified to account for 100GBASE-SR4 using FEC

SuggestedRemedy

Change to:
"A Forward Error Correction sublayer is available for all 40GBASE-R and 100GBASE-R copper and backplane PHYs as well as 100GBASE-SR4. It is optional for 40GBASE-KR4, 40GBASE-CR4 and 100GBASE-CR10 PHYs and mandatory for 100GBASE-CR4, 100GBASE-KR4, 100GBASE-KP4 and 100GBASE-SR4 PHYs."

Proposed Response *Response Status* **O**

Cl **45** *SC* **45.2.1.12.5a** *P* **30** *L* **1** # 78

Trowbridge, Steve Alcatel-Lucent

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

Title of clause should be 100GBASE-SR4 rather than 40GBASE-SR4

SuggestedRemedy

Change 40G to 100G

Proposed Response *Response Status* **O**

Cl **78** *SC* **78.1.3.3.1** *P* **37** *L* **30** # 79

Trowbridge, Steve Alcatel-Lucent

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

Deep sleep is optional for all electrical PHYs, but is not supported for any optical PHY

SuggestedRemedy

Change "an additional option for some of those PHYs" to "an additional option for electrical PHYs"

Proposed Response *Response Status* **O**

Cl **87** *SC* **87.7.2** *P* **72** *L* **22** # 80

King, Jonathan Finisar

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

Table 87-8, "Average receive power, each lane (max)" and "Receive power each lane (OMA) (max)", and Table 87-14 "channel insertion loss (min)".

To allow APD implementations, the max receive power values in Table 87-8 need to be reduced to accommodate the practical limitations of APD receivers. The proposed remedy was described and discussed in the smf ad hoc (see king_02_0613_smf) and met with no objections.

SuggestedRemedy

Table 87-8: Reduce 40GBASE-ER4 ‘Receive power, each lane (OMA) (max)’ value to -4 dBm (from -1 dBm); Reduce 40GBASE-ER4 ‘Average receive power, each lane (max)’ value to -4.5 dBm (from -1.5 dBm)
Table 87-14: Increase ‘Channel insertion loss (min)’ to 9 dB.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.10** *P* **107** *L* **22** # 81

King, Jonathan Finisar

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

Table 95-10 , note a, "An additional 300 ps Skew Variation ..." : the 300 ps value was teleported in from clause 86. Recent analysis for 100m OM$ reach is shown in (kolesar_01_0613_mmf)

SuggestedRemedy

Change note a from "An additional 300 ps of Skew Variation ...." to "An additional X ps of Skew Variation ...." where X is the skew variation for 100m OM4 calculated in kolesar_01_0613_mmf

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.8.5** *P* **104** *L* **20** # 82

King, Jonathan Finisar

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

TDP test definition reference is TBD. (line 20)
The reference receiver bandwidth for TDP testing is TBD Hz. (line 26)

MMF ad hoc agreed to reference clause 52 for TPD testing with exceptions appropriate to clause 95.
This was discussed in the MMF ad hoc, and proposed text was agreed for the TDP test section, and is recorded in king_01_0613_mmf-TDP.
The test definition reference should point to clause 52.
The reference receiver bandwdith should be 11.7 GHz

SuggestedRemedy

Change "Transmitter and dispersion penalty (TDP) shall be as defined in TBD with the following exceptions:" to
"Transmitter and dispersion penalty (TDP) shall be as defined in 52.9.10 with the following exceptions:"

Change "The reference receiver (including the effect of the decision circuit) has a fourth-order Bessel-Thomson filter response with a bandwidth of TBD Hz"
to
"The reference receiver (including the effect of the decision circuit) has a fourth-order Bessel-Thomson filter response with a bandwidth of 11.7 GHz".

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.8.1** *P* **103** *L* **31** # 83

King, Jonathan Finisar

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

Table 95-10
Calibration of OMA for receiver tests, subclause reference is marked TBD.
Vertical eye closure penalty calibration, subclause reference is marked TBD.

MMF ad hoc agreed to reference clause 52 for SRS testing with exceptions appropriate to clause 95.

Consequently, in Table 95-10, the rows for Calibration of OMA for receiver tests, and Vertical eye closure penalty calibration are part of the SRS test and should reference the relevant SRS sub clause 52.9.9

SuggestedRemedy

In Table 95-10:
in the row for "Calibration of OMA for receiver tests" change "TBD" to 52.9.9
in the row "Vertical eye closure penalty calibration" change "TBD" to 52.9.9

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.8.8** *P* **105** *L* **13** # 84

King, Jonathan Finisar

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

"Stressed receiver sensitivity shall be within the limits given in Table 95–7 if measured using the method defined in TBD with the following exceptions:"

This was discussed in the MMF ad hoc, proposed text for the SRS test section is recorded in king_02_0613_mmf-SRS.

SuggestedRemedy

Replace the text in section 95.8.8 (lines 13 to 21) with the proposed text shown on slide 6 of king_02_0613_mmf-SRS.

Add section 95.8.8.1 Receiver Jitter Tolerence as shown on slide 7 of king_02_0613_mmf-SRS.

Make changes to Table 95-7 as shown on slide 8 of king_02_0613_mmf-SRS.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.11.3.2** *P* **109** *L* **3** # 85

Kolesar, Paul CommScope

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

The reference to the IEC specificaiton is soon to be obsolete. A revised standard is currently entering FDIS stage. The interface designations in the FDIS are different from those currently stated. New interfaces for device receptacles are now defined that may be more appropriate. The new device receptacle for flat interface makes the present description of Figure 95-5 suboptimal.

SuggestedRemedy

Throughout this paragraph make the following changes. Replace all instances of "IEC 61754-7" with "IEC 61754-7-1". Replace "interface 7-3, the MPO adapter interface" with "interface 7-1-3: MPO adaptor interface - opposed keyway configuration, or interface 7-1-10: MPO active device receptacle, flat interface". Replace "interface 7-4, MPO female plug connector flat interface" with "interface 7-1-4: MPO female plug connector, flat interface for 2 to 12 fibres". All descriptive text folowing the interface numbers should be italicized for clarity. On line 7 delete "using an MPO adapter interface".

Proposed Response *Response Status* **W**

[Editor's note: Subclause changed from 11.3.2 to 95.11.3.2]

Cl **95** *SC* **95.10** *P* **107** *L* **22** # 86

Kolesar, Paul CommScope

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

The value of 300 ps stated in Note "a" to table 95-12 is too low. This value must account for the maximum channel length of 100 m and the effect of maximal wavelength shift 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 95-12. Also the sum of the Note "a" value and the value in Table 95-12 for Cabling Skew Variation must sum to the 2.8 ns allocation described in clause 95.3.2.

SuggestedRemedy

In Note "a" replace "300 ps" with "0.4 ns". Change the 2.5 ns value in Table 95-12 to 2.4 ns.

Proposed Response *Response Status* **W**

[Editor's note: Subclause changed from 10 to 95.10]

Cl **95** *SC* **95.11.3.2** *P* **109** *L* **20** # 87

Kolesar, Paul CommScope

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

The inset caption under right portion of the figure is made obsolete by the revision of IEC 61754-7 which is recast in part as 61754-7-1. This revision is in FDIS and defines new device receptacle interfaces that obsolete the current description in the caption which creates a device receptacle from an adapter interface. Recommend replacing the curent descritption with one that is directly intended for this purpose.

SuggestedRemedy

Replace inset caption on the right "MDI as a PMD receptacle meeting MPO adapter interface" with "MDI as active device receptacle with flat interface". Change the figure caption to "Figure 95-5 - MPO female plug with flat interface and MDI as an active device receptacle with flat interface".

Proposed Response *Response Status* **W**

[Editor's note: Clause changed from 96 to 95, Subclause changed from "Figure 95-5" to 95.11.3.2]

Cl **95** *SC* **95.11.3.2** *P* **109** *L* **25** # 88

Kolesar, Paul CommScope

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

A referenced perforamnce specification has been revised and renumbered. IEC 61753-1-1 is now IEC 61753-1 and is a general and guidance document that defines environmental categoies used by IEC 61753-022-2.

SuggestedRemedy

Change "IEC 61753-1-1" to "IEC 61753-1".

Proposed Response *Response Status* **W**

[Editor's note: Subclause changed from 11.3.2 to 95.11.3.2]

Cl **87** *SC* **87.7.1** *P* **71** *L* **5** # 89

Maguire, Valerie Siemon

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

Merging the two sentences in this clause would read more clearly and reinforce the idea that the same specifications and definitions apply to both transmitters.

SuggestedRemedy

Change line 5 to: The 40GBASE–LR4 transmitter and 40GBASE-ER4 transmitter shall meet the specifications defined in Table 87–7 per the definitions in 87.8.

Delete the second sentence beginning on line 6.

Proposed Response *Response Status* **W**

[Editor's note: Clause changed from 00 to 87]

Cl **87** *SC* **87.7.2** *P* **72** *L* **5** # 90

Maguire, Valerie Siemon

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

Merging the two sentences in this clause would read more clearly and reinforce the idea that the same specifications and definitions apply to both receivers.

SuggestedRemedy

Change line 5 to: The 40GBASE–LR4 receiver and 40GBASE-ER4 receiver shall meet the specifications defined in Table 87–8 per the definitions in 87.8.

Delete line 6.

Proposed Response *Response Status* **W**

[Editor's note: Clause changed from 00 to 87]

Cl **87** *SC* **87.7.2** *P* **72** *L* **9** # 91

Maguire, Valerie Siemon

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

Incorrect receive reference in table header.

SuggestedRemedy

Change: "Table 87–8—40GBASE–LR4 and 100GBASE–ER4 receive characteristics" to "Table 87–8—40GBASE–LR4 and 40GBASE–ER4 receive characteristics"

Proposed Response *Response Status* **W**

[Editor's note: Clause changed from 00 to 87]

Cl **87** *SC* **87.7.1** *P* **71** *L* **10** # 92

Maguire, Valerie Siemon

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

Incorrect receive reference in table header.

SuggestedRemedy

Change: "Table 87–8—40GBASE–LR4 and 100GBASE–ER4 transmit characteristics" to "Table 87–8—40GBASE–LR4 and 40GBASE–ER4 transmit characteristics"

Proposed Response *Response Status* **W**

[Editor's note: Clause changed from 00 to 87]

Cl **87** *SC* **87.11.1** *P* **77** *L* **25** # 93

Maguire, Valerie — Siemon

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

Missing a noun.

SuggestedRemedy

Insert "optical fiber" as shown:

"Using 0.5 dB/km optical fiber may not support operation at 10 km for 40GBASE–LR4 or 40 km for 40GBASE–ER4."

Proposed Response *Response Status* **W**

[Editor's note: Clause changed from 00 to 87]

Cl **95** *SC* **95.5.4** *P* **98** *L* **31** # 94

Petrilla, John — Avago Technologies

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

In Table 95-4, for OK, there's a condition, "Optical power at TP3 >/= receiver sensitivity (max) in OMA in Table 95-7" but there is no receiver sensitivity (max) in OMA in Table 95-7 or elsewhere in clause 95.

SuggestedRemedy

Add receiver sensitivity to table 95-7 or 95-8 and update the table 95-4 reference or delete this condition from the OK case.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.5.4** *P* **98** *L* **33** # 95

Petrilla, John — Avago Technologies

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

In Table 95-4 for OK there's a condition,"compliant 100GBASE-R signal input", but above in row 19 there's an apparently contradiction statement, "PMD receiver is not required to verify whether a compliant 100GBASE-SR4 signal is being received"

SuggestedRemedy

Restate the OK condition to avoid the appartent conflict or remove the condition from Table 95-4.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.7.1** *P* **100** *L* **52** # 96

Petrilla, John — Avago Technologies

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

In Table 95-6 the constraint, "Difference in launch power between any two lanes (max)" is unnecessary and may increase the complexity and cost of transmitter tests. Removal of this constraint results in setting the aggressors (currently not defined) during the stressed receiver sensitivity test to max OMA.

SuggestedRemedy

Delete "Difference in launch power between any two lanes (max)" from Table 95-6 and insert into Table 95-7 as a "Conditions of stressed receiver sensitivity test: "OMA of each aggressor lane" the max OMA from Table 95-6.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.7.1** *P* **101** *L* **7** # 97

Petrilla, John — Avago Technologies

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

In Table 96-6, the Tx eye mask coordinates are TBD. See associated contribution, petrilla_01_0713_optx.

SuggestedRemedy

Replace Tx eye mask TBD with 0.23, 0.34, 0.43, 0.31, 0.39, 0.4

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.7.2** *P* **101** *L* **42** # 98

Petrilla, John — Avago Technologies

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

In Table 95-7 there are TBDs for stressed Rx sensitivity and its conditions. See associated contribution, petrilla_01_0713_optx.

SuggestedRemedy

Replace the TBD for Stressed receiver sensitivity (OMA) with -5.6.
Replace the TBD for Vertical eye closure penalty with 3.6
Replace, "Stressed eye jitter, each lane TBD" with "Stressed eye J2 jitter, each lane 0.41 UI" and add
"Stressed receiver 5E-5 eye mask definition {X1, X2, X3, Y1, Y2, Y3}" with values 0.21, 0.5, 0.5, 0.28, 0.28, 0.4

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.7.2** *P* **101** *L* **48** # 99

Petrilla, John Avago Technologies

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

Table 95-7 (unlike Clause 86.7.3 Table 86-8) does not include a definition for receiver jitter tolerance rather in 95.8.8 jitter tolerance is included in the stressed receiver sensitivity test method. Combining jitter tolerance and stressed reciever test may lead to undesired overstress and not having all the receiver requirements in a single table results in an unnecessarily complex clause. The practice established in clause 86 should be followed.

SuggestedRemedy

For jitter tolerance definition follow the practice established in clause 86. Specifically, add to Table 95-7 the "Receiver jitter tolerance in OMA, ..." requirement and "Conditions of reciever jitter tolerance test: ...", modified as appropriate for signal rate and also modifying the aggressor OMA to Tx max OMA per comment on Table 95-6, Difference in launch power ...
In 95.8.8 delete exception a) and delete Table 95-11.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.7.3** *P* **102** *L* **21** # 100

Petrilla, John Avago Technologies

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

To be consistent with the link model, in Table 95-8 the allocation for penalties (for max TDP) should be 6.3 dB. See associated contribution, petrilla_01_0713_optx.

SuggestedRemedy

In Table 95-8 change the Allocation for penalties (for max TDP) to 6.3 for both OM3 and OM4.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.8.1** *P* **103** *L* **25** # 101

Petrilla, John Avago Technologies

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

In Table 95-10.the patterns for Extinction Ratio are 3, 5 or valid 100GBASE-R signal and the patterns for OMA are Square wave or 4. This mismatch in patterns between the OMA and ER test is unnecessary and problematic in that it breaks the relationship between average power and OMA, RIN and RINoma leading to needless additional complexity in manufacturing test and calibration.

SuggestedRemedy

In table 95-10 for Extinction Ratio change "3, 5 or valid 100GBASE-R signal" to "Square wave or 4" and change 95.8.6 as appropriate, e.g. delete the note, 'Extinction ratio and OMA are defined with different test patterns (see Table 95–10)'.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.9.2** *P* **105** *L* **43** # 102

Petrilla, John Avago Technologies

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

Clause 95.9.2 calls for Hazard Level 1 conformity, while in Clause 86.9.2 40GBASE-SR4 and 100GBASE-SR10, Class 1 M is acceptable. There have been no contributions identifying a need to tighten this requirement. A tighter restriction than that acceptable for 40GBASE-SR4 and 100GBASE-SR10 will lead to higher than necessary manufacturing costs.

SuggestedRemedy

In Clause 95.9.2 change Hazard Level 1 to Hazard Level 1M

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.8.5** *P* **104** *L* **30** # 103

Petrilla, John Avago Technologies

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

Item f) calls for a +/- 0.15 UI offset, while the link budget was calculated for a +/- 0.11 UI offset. See associated contribution, petrilla_01_0713_optx.

SuggestedRemedy

In item f) change '+/- 0.15 UI offset' to '+/- 0.11 UI offset'

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.1** *P* **158** *L* **2** # 104

Petrilla, John Avago Technologies

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

Table 83E-1 does not include single-ended output voltage specs that would define the min input withstand capability of devices, e.g. module receiver, connected to the host transmitter. Differential and common mode specs are provided but neither are as meaningful.

SuggestedRemedy

Add to Table 83E-1 single-ended output voltage specs, one a max with a value of 2.8 V and another a min with a value of -0.3 V.

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.1** *P* **158** *L* **15** # 105

Petrilla, John Avago Technologies

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

Differential output voltage (max) should be stated as either peak-to-peak or absolute value. See also table 83E-3.
Further, an apparently similar parameter in tables 83D-1 and 83D-3 is labeled Amplitude peak-to-peak (max). If these are different names for the same characteristic, it would reduce complexity and improve carity to use the same name.

SuggestedRemedy

Change, "Differential output voltage (max)" to either "Peak-to-peak differential output voltage (max)" or "Differential output voltage, absolute value (max)" and establish consistency with 83D as appropriate. Repeat in table 83E-3.

Proposed Response *Response Status* **O**

Cl **83E** *SC* **8e#.3.1.2** *P* **158** *L* **35** # 106

Petrilla, John Avago Technologies

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

83E.3.1.2 defines "differential output voltage vdi" that is never used except in the accompanying Figure 83E-6. However "peak-to-peak differential output voltage" is used in several places but never defined as well as vdi.

SuggestedRemedy

Delete the sentence defining vdi and the associated equation in Figure 83E-6 unless some use is made of this term.
Add a definition for "peak-to-peak differential output voltage".

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.1.2** *P* **159** *L* **1** # 107

Petrilla, John Avago Technologies

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

In the first sentence of the paragraph, "The peak-to-peak differential output voltage shall be less than or equal to 900 mV ..." isn't consistent with Table 83E-1, where the 900 mV limit is associated with "Differential output voltage (max)". Further in the second sentence, "The peak-to-peak differential output voltage shall be less than or equal to 35 mV ..." isn't consistent with "Maximum differential pk-pk output voltage when transmitter is disabled" in Table 83E-1. See another comment regarding whether "Differential output voltage (max)" in Table 83E-1 should be peak-topeak or just differential. Please make these consistent

SuggestedRemedy

Pick a name for this attribute, e.g. differential peak-to-peak output voltage, and use only it in 83D and 83E.

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.1.3** *P* **159** *L* **10** # 108

Petrilla, John Avago Technologies

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

In the sentence, "This output impedance requirement applies to all valid output levels.", the word, "impedance" apparently referring to return loss is inappropriate.

SuggestedRemedy

Change "This output impedance requirement applies to all valid output levels." to "This output requirement applies to all valid output levels."

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.1.6.1** *P* **163** *L* **23** # 109

Petrilla, John Avago Technologies

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

The caption for Figure 83E-10 seems misaligned.

SuggestedRemedy

Center the caption for Figure 83E-10

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.3.1** *P* **165** *L* **27** # 110

Petrilla, John Avago Technologies

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

In Table 83E-5 the attribute, "Differential pk-pk input amplitude tolerance (min)", while useful for signal integrity considerations is not as useful for voltage breakdown or withstand considerations. A differential voltage tolerance is better in this regard. By the way, here the word "amplitude" is used, why not "voltage" as in table 83E-1?

SuggestedRemedy

Add to table 83E-5 a "Differential input voltage tolerance, absolute value (min)," with a min of 450 mV
Change, "Differential pk-pk input amplitude tolerance (min)" to "Differential pk-pk input voltage tolerance (min)"

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.3.1** *P* **165** *L* **37** # 111

Petrilla, John Avago Technologies

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

The statement, "The CAUI-4 receiver shall operate at a bit error ratio (BER) better than 10-15." needs qualifications. See also 83E.3.4.1.

SuggestedRemedy

Change, "The CAUI-4 receiver shall operate at a bit error ratio (BER) better than 10-15." to "The CAUI-4 chip-module host receiver shall operate at a bit error ratio (BER) better than 10-15 for signals defined by Table 83-5 and 83E.3.3.3."
Repeat in 83E.3.4.1 with appropriate adjustments for chip-module module receiver.

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.4.2** *P* **171** *L* **36** # 112

Petrilla, John Avago Technologies

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

Item 3) states, "Use the differential equalized signal from step 2 ...", but step 2 doesn't provide instruction, e.g. maximize eye height, regarding equalization. This can lead to inconsistent results.

SuggestedRemedy

Change Item 2 from "Apply respective reference receiver CTLE to captured signal" to "Apply respective reference receiver CTLE to captured signal to maximize the eye opening, e.g. normalized eye height + normalized eye width"

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.4.2** *P* **171** *L* **28** # 113

Petrilla, John Avago Technologies

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

"eye with" should be "eye width"

SuggestedRemedy

Change "eye with" to "eye width"

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.4** *P* **169** *L* **13** # 114

Petrilla, John Avago Technologies

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

In Table 83E-8 the attribute, "Differential pk-pk input amplitude tolerance (min)", while useful for signal integrity considerations is not as useful for voltage breakdown or withstand considerations. A differential voltage tolerance is better in this regard. By the way, here the word "amplitude" is used, why not "voltage" as in table 83E-1?

SuggestedRemedy

Add to table 83E-8 a "Differential input voltage tolerance, absolute value (min)," with a min of 450 mV
Change, "Differential pk-pk input amplitude tolerance (min)" to "Differential pk-pk input voltage tolerance (min)"

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.4** *P* **169** *L* **14** # 115

Petrilla, John Avago Technologies

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

Table 83E-8 does not include single-ended voltage tolerance specs that would define the min input withstand capability of the module receiver. Differential and common mode specs are provided but neither are as meaningful.

SuggestedRemedy

Add to Table 83E-8, single-ended voltage tolerance specs, one a max with a value of 2.8 V and another a min with a value of -0.3 V.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.3.2** *P* **96** *L* **2** # 116

Petrilla, John Avago Technologies

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

Subclause 87.8.2 which defines WDM PMD is referenced for skew & skew variation for a parallel PMD and 87.8.2 includes a reference to 86.8.3.2 (86 is also for a parallel PMD). It would be more relevant, simpler and less confusing to reference 86 instead of 87.

SuggestedRemedy

Change "measurements of Skew and Skew Variation are defined in 87.8.2 ..." to "measurements of Skew and Skew Variation are defined in 86.8.3.1 ..."

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D.1** *P* **140** *L* **8** # 117

Brown, Matt APM

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

Figure 83D-2, a diagram of the chip-chip CAUI-4 channel includes host, connector, and module. It looks like this is a cut and paste of the Chip-Module CAUI-4.

SuggestedRemedy

Remove connector and show single PCB section.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **0** *L* **0** # 118

Brown, Matt APM

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

WRT CAUI-4, there are various references of:
(a) "chip-chip" and "chip-to-chip" interface
(b) "chip-model" and "chip-to-module" and "chip to module"

SuggestedRemedy

Consolidate to one phrase for each interface type:
"chip-to-chip"
"chip-to-module"

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D.3.1** *P* **141** *L* **48** # 119

Brown, Matt APM

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

Table footnotes are redundant. Each row in the table reference to a subclause which fully defines the parameter and/or test method and conditions. Random jitter is not defined just by "BER" limit, but also by an extrapolation methodology which by extension should also be included in the footnotes.

SuggestedRemedy

Delete footnotes a, b, and c.

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D.3.1.2** *P* **142** *L* **32** # 120

Brown, Matt APM

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

Regarding the sentence "This output impedance requirement applies to all valid output levels."

The specification is for return loss not impedance, granted there is direct mapping between the two. Should refer to either return loss or just the requirement.

The phrase "all valid output levels" implies that the return loss should be measure with the output being active. If thats the case then it should be more clearly stated and the conditions of "active" should be more explicit. Also, if relevant for all output levels it should also apply to all equalization settings, or as a minimum the intended equalization setting (e.g., EQ disabled) should be explicit.

SuggestedRemedy

Change the sentence to:
The return loss is measured with the output active with a PRBS9 pattern and with any valid output level or de-emphasis setting.

Change 83E.3.1.3 similarly.

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D.3.1.2** *P* **143** *L* **21** # 121
Brown, Matt APM

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

Figure 83D-5 is the differential return loss (as opposed to common mode return loss).

SuggestedRemedy

Change Figure 83D-5 to "Transmitter output differential return loss"

Do the same for Figure 83E-7.

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D.3.1.4.1** *P* **144** *L* **24** # 122
Brown, Matt APM

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

The use of angular frequency for the poles and zeros makes equation 83D-4 unnecessarily cluttered. Also, Table 83D-2 defines the poles in GHz, not Grad/s.

SuggestedRemedy

In Equation 83D-4, delete all instances of 2*pi.

Change the units for P1, P2, and Z1 (lines 31 and 32) to GHz.

In table 83D-2, change the headings of columns 3 to 5 to P1, P2, and P3.

Do the same in 83E.3.1.6.

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D.3.2.2.1** *P* **148** *L* **5** # 123
Brown, Matt APM

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

As shown, BER has units of dB.

SuggestedRemedy

Delete "dB".

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D.3.2.2.1** *P* **148** *L* **6** # 124
Brown, Matt APM

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

Why 5x105/f? Can we simplify to 525/f?

SuggestedRemedy

Change 5*105/f to 525/f.

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D.4** *P* **148** *L* **52** # 125
Brown, Matt APM

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

The value of COM must also take into the receiver de-emphasis step size specified in 83D.3.1.4.1. Based on the title and content of 83D.3.1.6 the transmitter equalization is defined by pre-emphasis setting not coefficient settings; also, it is not clear that the standard imposes a particular step size. Assuming the transmitter minimum and maximum pre-emphasis is configurable and that the step size minimum and maximum between setting is specified then this must be taken into consideration.

SuggestedRemedy

Change: "This minimum value allocates margin for practical limitations
on the receiver implementation as well as the largest step size allowed for transmitter equalizer coefficients."
To: "This minimum value allocates margin for practical limitations
on the receiver implementation, largest step size allowed for receiver pre-emphasis, and largest step size allowed for transmitter pre-emphasis.

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D** *P* **149** *L* **2** # 126
Brown, Matt APM

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

Several parameters in the COM parameters table defined in 802.3bj Annex 93A were added, changed, and/or modified in Draft 2.1.

SuggestedRemedy

Update the table to match the coefficients in 802.3bj draft 2.1 Annex 93A and add/modify values appropriately.

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.4** *P* **169** *L* **10** # 127

Brown, Matt APM

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

Table 83E-8 is a summary table. It is not normative. Each summarized parameter requires a relevant description and normative requirement statement.

Signalling rate and unit interval refer to a subclause for transmitter requirements. The subclause is written generically (not refering to receiver or transmitter) so this might be okay.

Input amplitude tolerance refers to transmitter output requirements, written very specifically as such. A receiver input subclause with appropriate normative language must be add.

A reference to the stressed receiver test in 83.3.4.2 should be include in the table. The value and units can be left blank.

The differential mismatch refers to a transmitter specification. This is written generically, so may be okay.

SuggestedRemedy

Write new subclause for "Differential pk-pk input amplitude tolerance" and update subclause reference in Table 83E-8.

Add new row and add a reference to "module stressed receiver test" with reference to 83E.3.4.2 and with value/units left blank.

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.4** *P* **171** *L* **13** # 128

Brown, Matt APM

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

section should be subclause (or should it be subannex?)

in 802.3-2012, section is a volume of subclauses

SuggestedRemedy

On line 13, change "section" to "subclause".

On line 14 delete two instance of "section".

Elsewhere...

On page 123, line 43, change "section" to "subclause"

On age 141, lines 5 and 7, delete "section" (two instances)

In figure 83D-1, footnote b, delete "section"

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.4.2** *P* **171** *L* **33** # 129

Brown, Matt APM

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

I am not clear on what "equivalent to at least TBD bits means". Its the word "equivalent" that is throwing me off. Does this mean spanning at least TBD bits? Or there an assumption of a non-continuous (e.g., not real time) sampling such as when using a sampling scope?

SuggestedRemedy

Express "equivalent to at least TBD bits" more clearly.

Proposed Response *Response Status* **O**

Cl **01** *SC* **1.4.73** *P* **20** *L* **45** # 130

Brown, Matt APM

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

remove superfluous commas

SuggestedRemedy

Change: "(See IEEE Std 802.3, Annex 83A, and Annex 83B for CAUI-10 or Annex 83D, and Annex 83E for CAUI-4.)"
To: "(See IEEE Std 802.3, Annex 83A and Annex 83B for CAUI-10 or Annex 83D and Annex 83E for CAUI-4.)"

It may help to add a comma after "CAUI-10".

Proposed Response *Response Status* **O**

Cl **01** *SC* **1.5** *P* **21** *L* **1** # 131

Brown, Matt APM

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

The acronym applies generally to an N-lane CAUI.

SuggestedRemedy

Change definition to "N-lane 100 Gigabit Attachment Unit Interface".

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.1.1** *P* **94** *L* **40** # 132

Brown, Matt APM

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

The term "frame loss ratio" is used only once or twice in each clause. Use of an acronym is unnecessary. The acronym FLR is not defined in subclause 1.5. Clauses 92, 93, and 94 do not make use of the acronym FLR.

Also, in keeping with the style for clauses 92, 93, and 94 in 802.3bj, add a reference to the definition of frame loss ratio.

SuggestedRemedy

On line 40 change "frame loss ratio (FLR)" to "frame loss ratio (see 1.4.210a)"

On line 44 change "FLR" to "frame loss ratio".

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.5.1** *P* **97** *L* **13** # 133

Brown, Matt APM

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

It is not ever specified or described whether the optical signals transmitted across a single fiber for all lanes or one fiber for each lane or over fiber at all.

Also, in figure 95-2, what appears to be four fibers are not labelled as such nor is the medium labelled.

Finally, in figure 95-2 it is redundant to put an ampersand (presumably) to represent the logical-and function inside of an AND symbol.

SuggestedRemedy

Add text explaining that each lane is transmitted across one of four fibers. As an example add the following between the first and second sentence: "The 100GBASE-SR4 PMD uses 4 lanes in each direction utilizing multiple-pair optics on multi-mode fiber."

In figure 95-2, add text labelling the four fibers as such including that this is the medium.

In figure 95-2, delete "&" in the AND block.

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D.3.3.2.1** *P* **148** *L* **22** # 134

Ghiasi, Ali Broadcom

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

Missing CTLE pole /zero

SuggestedRemedy

Add section for reference CTLE for measurement of eye at TP5 as well as caliburation of the inteference sigal at TP5a. The CTLE gain are normalized to 0 dB with filter loss from 1-15 dB, please see ghaisi_01_0714_optx for the pole zero response

Proposed Response *Response Status* **W**

[Editor's note: Subclause changed from 3.3.2.1 to 83D.3.3.2.1]

Cl **83D** *SC* **83D.4** *P* **149** *L* **11** # 135
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **X**
Device cpacitance missing

SuggestedRemedy
0.25 pf

Proposed Response *Response Status* **W**
[Editor's note: Subclause changed from 4 to 83D.4]

Cl **83D** *SC* **83D.4** *P* **149** *L* **24** # 136
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **X**
Transmitter equalizer, pre cursor missing

SuggestedRemedy
May have range of 1-7 dB in 0.5 dB step (assume the 1 dB is necessary to meet TP0a eye mask)

Proposed Response *Response Status* **W**
[Editor's note: Subclause changed from 4 to 83D.4]

Cl **83D** *SC* **83D.4** *P* **149** *L* **32** # 137
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **X**
Transmitter pre-cursor missing

SuggestedRemedy
Transmitter pre-curosr may have range of 0-3 dB in 0.5 dB increment

Proposed Response *Response Status* **W**
[Editor's note: Subclause changed from 4 to 83D.4]

Cl **83D** *SC* **83D.4** *P* **149** *L* **31** # 138
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **X**
Continous time filter paramters are missing

SuggestedRemedy
Replace DC gain with AC gain = 0 dB
Minimum DC gain = -15 dB
Maximum DC gain = -1 dB
Step size = 1 dB

For the pole/zeor please see ghiasi_01_0713_optx

Proposed Response *Response Status* **W**
[Editor's note: Subclause changed from 4 to 83D.4]

Cl **83D** *SC* **83D.4.1** *P* **149** *L* **50** # 139
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **X**
Missing channel return loss

SuggestedRemedy
Channel return loss is 3 dB beter than CL92 host IC return loss or

15 - 0.5*f, 0.01<=f<=8 GHz
8.65-9.71*log10(f/14), 8Ghz<f<=19 GHz

Proposed Response *Response Status* **W**
[Editor's note: Subclause changed from 4.1 to 83D.4.1]

Cl **83E** *SC* **83E.2** *P* **157** *L* **20** # 140
Ghiasi, Ali Broadcom

Comment Type **ER** *Comment Status* **X**
TP1a and TP4a lie

SuggestedRemedy

Proposed Response *Response Status* **W**
[Editor's note: Subclause changed from 2 to 83E.2]

Cl **83E** *SC* **83E.3.1** *P* **158** *L* **16** # 141
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **X**
Ouput total jitter TBD

SuggestedRemedy
Output total jitter at 1e-15 = 0.56 UI
Also add note to measuremnt method using referene CTLE of section 3.1.6.1 and eye contour method of 83E.4.2

Proposed Response *Response Status* **W**
[Editor's note: Subclause changed from 3.1 to 83E.3.1]

Cl **83E** *SC* **83E.3.1** *P* **158** *L* **16** # 142
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **X**
Eye height miimum is missing

SuggestedRemedy
Eye Height EH 1e-15 = 95 mV
Also add note to measuremnt method using referene CTLE of section 3.1.6.1 and eye contour method of 83E.4.2

Proposed Response *Response Status* **W**
[Editor's note: Subclause changed from 3.1 to 83E.3.1]

Cl **83E** *SC* **83E.3.4.2** *P* **169** *L* **42** # 143
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **X**
Table 83E-9 module stress receiver paramters missing

SuggestedRemedy
Minimum total input jitter 1E-15 = 0.54 UI
Eye Height 1E-15 = 95 mV

Proposed Response *Response Status* **W**
[Editor's note: Subclause changed from 3.4.2 to 83E.3.4.2]

Cl **83E** *SC* **83E.3.3.1** *P* **165** *L* **20** # 144
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **X**
Missing Eye Height at TP4

SuggestedRemedy
Please add EH 1E-15 to the table with value of 228 mV

Proposed Response *Response Status* **W**
[Editor's note: Subclause changed from 3.3.1 to 83E.3.3.1]

Cl **83E** *SC* **83E.3.3.1** *P* **165** *L* **20** # 145
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **X**
Missing Eye Width at TP4

SuggestedRemedy
Please add EW 1E-15 to the table with value of 0.57 UI

Proposed Response *Response Status* **W**
[Editor's note: Subclause changed from 3.3.1 to 83E.3.3.1]

Cl **83E** *SC* **83E.3.3.1** *P* **165** *L* **34** # 146
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **X**
Tranistion time missing

SuggestedRemedy
Add minimum transition time of 9.5 ps 20-80%

Proposed Response *Response Status* **W**
[Editor's note: Subclause changed from 3.3.1 to 83E.3.3.1]

Cl **83E** *SC* **83E.3.3.1** *P* **165** *L* **28** # 147
Ghiasi, Ali Broadcom

Comment Type **TR** *Comment Status* **X**
Vertical Eye Clousure Penalty missing

SuggestedRemedy
Please add VECP with max value of 5.5 dB

Proposed Response *Response Status* **W**
[Editor's note: Subclause changed from 3.3.1 to 83E.3.3.1]

Cl **83E** *SC* **83E.3.3.1** *P* **165** *L* **35** # 148

Ghiasi, Ali Broadcom

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

Common Mode volate missing

SuggestedRemedy

Please add common mode voltage with min value of -0.3 V and max value of 2.8 V

Proposed Response *Response Status* **W**

[Editor's note: Subclause changed from 3.3.1 to 83E.3.3.1]

Cl **83D** *SC* **83D.1** *P* **140** *L* **18** # 149

Ghiasi, Ali Broadcom

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

Editor note TBC

SuggestedRemedy

Remove the editor note with
CAUI-4 C2C informative channel loss budget is given by equation 83D-1. The normative channel compliance is through CAUI-4 COM Matlab Code, where the actual channel loss could be higher or lower due to the channel ILD, return loss, and crostalk.

Proposed Response *Response Status* **W**

[Editors note: Clause changed from 93D to 83D, Subclause changed from 4.1 to 83D.1, Page changed from 148 to 140]

Cl **83D** *SC* **83D.3.1** *P* **141** *L* **18** # 150

Ghiasi, Ali Broadcom

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

Wrong reference name

SuggestedRemedy

Replace TP1a with TP0a through the chapter

Proposed Response *Response Status* **W**

[Editor's note: Subclause changed from 3.1 to 83D.3.1]

Cl **83D** *SC* **83D.3.1** *P* **141** *L* **44** # 151

Ghiasi, Ali Broadcom

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

Output waveform TBD

SuggestedRemedy

Eye mask coordinates are
(0.14 UI,0), (0.4 UI, +/-0.2 V) (0.6 UI, +/-0.2UI), (0.86 UI, 0)

The above eye mask is defiend at BER 1E-15, transmitter FFE may be adjusted for optimum response
See ghaisi_01_0713_optx

Proposed Response *Response Status* **W**

[Editors note: Clause changed from 83d to 83D, Subclause changed from 3.1 to 83D.3.1]

Cl **83D** *SC* **83D.3.1** *P* **141** *L* **46** # 152

Ghiasi, Ali Broadcom

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

De-emphasis range TBD

SuggestedRemedy

Transmitter FIR shall provide post-cursor with minimum de-emphais of 6 dB in addition to any amount applied for optimum setting in 83D.3.1.5. The transmitter FIR shall provide pre-cursor with minimum de-emphasis of 3 dB in to any amount applied for optimum setting in 83D.3.1.5.

See ghaisi_01_0713_optx

Proposed Response *Response Status* **W**

[Editors note: Clause changed from 83d to 83D, Subclause changed from 3.1 to 83D.3.1]

Cl **83D** *SC* **83D.3.1.2** *P* **142** *L* **48** # 153
Ghiasi, Ali Broadcom

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

Common mode return loss is tighter than differential above 6 GHz

SuggestedRemedy

Replace with
RLcm=9.05-f (dB) 0.05<=f<=6 GHz
= 3.45-0.075*f 6<=f<=19 GHz

Common mode return loss will follow differential but will be 3 dB more relax

Proposed Response *Response Status* **W**

[Editors note: Subclause changed from 3.1.2 to 83D.3.1.2]

Cl **83D** *SC* **83D.3.1.4** *P* **144** *L* **10** # 154
Ghiasi, Ali Broadcom

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

Differential amplitude of TBd

SuggestedRemedy

Replace TBD with 400 mV

Proposed Response *Response Status* **W**

[Editors note: Subclause changed from 3.1.4 to 83D.3.1.4]

Cl **83D** *SC* **83D.3.1.4** *P* **144** *L* **10** # 155
Ghiasi, Ali Broadcom

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

Transition time of TBD

SuggestedRemedy

Repalce transmition time with "meeting eye maskper 83D.3.1.5"

Proposed Response *Response Status* **W**

[Editors note: Subclause changed from 3.1.4 to 83D.3.1.4]

Cl **83D** *SC* **83D.3.1.4** *P* **144** *L* **13** # 156
Ghiasi, Ali Broadcom

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

Test pattern TBD

SuggestedRemedy

Replace test pattern TBD with PRBS9

Proposed Response *Response Status* **W**

[Editors note: Subclause changed from 3.1.4 to 83D.3.1.4]

Cl **83D** *SC* **83D.3.1.4.1** *P* **144** *L* **16** # 157
Ghiasi, Ali Broadcom

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

This section is not needed

SuggestedRemedy

Since the transmitter already has 3 tap FFE then the FFE should be used for optimum eye measurement at TP0a, save the section and move it for TP5 measurement

Proposed Response *Response Status* **W**

[Editor's note: Comment Type set to T, Subclause changed from 3.1.4.1 to 83D.3.1.4.1]

Cl **83D** *SC* **83D.3.1.5** *P* **145** *L* **54** # 158
Ghiasi, Ali Broadcom

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

Eye mask is TBD

SuggestedRemedy

Add eye mask definition per
Eye mask coordinates are
(0.14 UI,0), (0.4 UI, +/-0.2 V) (0.6 UI, +/-0.2UI), (0.86 UI, 0)

The above eye mask is defiend at BER 1E-15, transmitter FFE may be adjusted for optimum response
See ghaisi_01_0713_optx

Proposed Response *Response Status* **W**

[Editors note: Subclause changed from 3.1.5 to 83D.3.1.5]

Cl **83D** *SC* **83D.3.1.6** *P* **146** *L* **7** # 159

Ghiasi, Ali Broadcom

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

De-emphasis range

SuggestedRemedy

Extend method of 83A.3.3.1 to have minimum of
6 dB post cursor in maximum increments 0.5 dB
3 dB of pre cursor in maximum increment of 0.5 dB

Also update De-emphasis range in table 83D-3

see ghiasi_01_0713_optx for the details

Proposed Response *Response Status* **W**

[Editors note: Subclause changed from 3.1.6 to 83D.3.1.6]

Cl **83D** *SC* **83D.3.2** *P* **146** *L* **19** # 160

Ghiasi, Ali Broadcom

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

Input amplitude max

SuggestedRemedy

Max input range 1000 mV differential p-p to futuer proof with smaller geometry CMOS

Proposed Response *Response Status* **W**

[Editors note: Subclause changed from 3.2 to 83D.3.2]

Cl **83D** *SC* **83D.3.2** *P* **146** *L* **10** # 161

Ghiasi, Ali Broadcom

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

Receiver characteristics are measured at TP5 not TP5a

SuggestedRemedy

Replace TP5a with TP5

Proposed Response *Response Status* **W**

[Editors note: Subclause changed from 3.2 to 83D.3.2]

Cl **83D** *SC* **83D.3.2.2** *P* **147** *L* **49** # 162

Ghiasi, Ali Broadcom

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

Receiver interference toelrnace compliance point need to be defiend

SuggestedRemedy

Receiver inteference toelrnace is applied at TP5a, TP5a is a point with PCB trace loss of 1.2-1.6 dB @12.87 GHz from the receiver chip

Please duplicate 93.8.2.1
Add digram showing where TP0, TP0a, TP5, TP5a are, please see ghiasi_01_0714_optx

Proposed Response *Response Status* **W**

[Editors note: Subclause changed from 3.2.2 to 83D.3.2.2]

Cl **83D** *SC* **3.2.2.1** *P* **148** *L* **5** # 163

Ghiasi, Ali Broadcom

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

Table 83D-4 missing paramters

SuggestedRemedy

Adjust pattern generator such that the out has 0.14 UI of dual dirac DJ, then apply borad band noise source till total jitter at output of pattern generator is 0.28 UI at BER 1e-15.

Channel insertion loss at 12.89 GHz=15 dB (reference channel)

Optimize the output eye for maximum eye opening by selecting the optimum CTLE from 1 dB to 15 dB.

Adjust inteference generator if needed to have 1E-15 eye opening of 40 mV at TP5. The target eye width at TP5 recomended to be 0.45 UI. To meet the target eye opening at TP5 pattern generator randon jitter and determinisitic jitter may need to be adjsuted.

See ghiasi_01_0713_optx

Proposed Response *Response Status* **W**

[Editors note: Subclause changed from 3.2.2.1 to 83D.3.2.2.1]

Cl **85** *SC* **85.13.3** *P* **63** *L* **44** # 164

Dudek, Mike QLogic

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

If the CAUI-n extension is used for the system it would be useful to know whether the system is capable of CAUI-10 or CAUI-4 or both.

SuggestedRemedy

Change the item to read "CAUI-10" and if my comment 2 (for line 25 and 26) on this page is not accepted then insert another row for CAUI-4. that is also optional.

Proposed Response *Response Status* **O**

Cl **86** *SC* **86.8.4.7** *P* **66** *L* **10** # 165

Dudek, Mike QLogic

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

There is an inconsistency between Table 86-1 and this paragraph. Table 86-1 allows for the use of CAUI-4, but that is not covered in this paragraph.

SuggestedRemedy

Either change "CAUI-10" to "CAUI-4" on line 10 and add "or the requirements in table 83-3 for CAUI-4" to the end of the paragraph.
Or
Delete the CAUI-4 row from Table 86-1

Proposed Response *Response Status* **O**

Cl **87** *SC* **87.1** *P* **67** *L* **34** # 166

Dudek, Mike QLogic

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

XLPPI should be optional for 40GBASE-ER4. It certainly isn't required and there is no reason that it would not be optional.

SuggestedRemedy

Replace the "TBD" with "Optional"

Proposed Response *Response Status* **O**

Cl **87** *SC* **87.3.1** *P* **68** *L* **51** # 167

Dudek, Mike QLogic

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

The sum of the delays shouldn't be for 40GBASE-LR4 AND 40GBASE-ER4, as this implies the delay of two concatenated links.

SuggestedRemedy

Change "and" to "or".

Proposed Response *Response Status* **O**

Cl **87** *SC* **87.7.3** *P* **73** *L* **14** # 168

Dudek, Mike QLogic

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

The power budget should be included for 40GBASE-ER4 in table 87-9

SuggestedRemedy

Insert 21.1 for the power budget row for 40GBASE-ER4 (This is the sume of the channel insertion loss plus the allocation for penalties.)

Proposed Response *Response Status* **O**

Cl **87** *SC* **87.7.3** *P* **73** *L* **18** # 169

Dudek, Mike QLogic

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

In table 87-9 the channel insertion loss is not calculated per footnote b for the 40km link and therefore it is incorrect to apply footnote b to the parameter column.

SuggestedRemedy

Move footnote b reference to the LR4 and 30km columns of this row. Add footnote a to the 40km row. Consider deleteing footnote a from the distance row.

Proposed Response *Response Status* **O**

Cl **92** *SC* **92.14.3** *P* **87** *L* **45** # 170

Dudek, Mike QLogic

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

It would be helpful to know whether the system is capable of supporting CAUI-10 or CAUI-4 or both.

SuggestedRemedy

Change "CAUI-n" to "CAUI-10" and add a row for CAUI-4 in the table. Do the same for clauses 93 and 94.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.5.4** *P* **98** *L* **31** # 171

Dudek, Mike QLogic

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

There is no parameter "receiver sensitivity (max)" in table 95-7. For clarity this should be changed to "stressed receiver sensitivity (max)" which is in table 95-7.

SuggestedRemedy

As per comment.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.6** *P* **100** *L* **5** # 172

Dudek, Mike QLogic

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

This system uses FEC and it is important that the FEC is capable of receiving the lanes in any arrangement.

SuggestedRemedy

Change "as the PCS is" to "as the PCS and RS-FEC are"

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.7.3** *P* **102** *L* **21** # 173

Dudek, Mike QLogic

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

The Power budget does not add up and also the TDP test does not include the effects of Mode Partition noise and Modal Noise so the allocation of penalties should be larger than the max TDP.

SuggestedRemedy

Change the Power budget value to equal the sum of Channel Insertion loss, allocation for penalties, and additional insertion loss allowed. Increase the allocation for penalties by 0.4dB above the TDP max value to account for the Modal noise, Mode Partition noise, and residual link penalties when the reference transmitter is going into the reference receiver in the TDP test, (These are not present in the TDP test.)

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.8.1** *P* **103** *L* **11** # 174

Dudek, Mike QLogic

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

By the time the scrambled idle reaches the PMD it should have been RS-FEC encoded.

SuggestedRemedy

In Table 95-9 change "Scrambled idle" to "RX-FEC encoded scrambled idle".

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.8.5** *P* **104** *L* **19** # 175

Dudek, Mike QLogic

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

To complete the description of the TDP test it is important to include a description of the Reference Transmitter.

SuggestedRemedy

Add description of the reference transmitter. Suggest this is scaled from the one in Clause 86.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.9.2** *P* **105** *L* **54** # 176

Dudek, Mike QLogic

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

The footnote has been separated from the reference to it.

SuggestedRemedy

Adjust page breaks etc. to ensure the footnote is on the same page as the reference.

Proposed Response *Response Status* **O**

Cl **83C** *SC* **83C.1a.2** *P* **136** *L* **7** # 177

Dudek, Mike QLogic

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

The figure 83C-2b is only showing an example with CAUI-10 whereas the section title and figure title say CAUI-n.

SuggestedRemedy

Either change the title and figure title from CAUI-n to CAUI-10 or better add an alternate stack with CAUI-4. Make the same changes in section 83C.2.2 and figure 83C-4.

Proposed Response *Response Status* **O**

Cl **83C** *SC* **83C.1a.2** *P* **136** *L* **21** # 178

Dudek, Mike QLogic

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

My understanding is that the RS-FEC operates with a 20 lane inteface on both it's input and output.

SuggestedRemedy

In Figure 83C-2b change the PMA below the RS-FEC from 4:4 to 20:4.

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D.1** *P* **139** *L* **30** # 179

Dudek, Mike QLogic

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

My understanding is that the RS-FEC has a 20 lane input and a 20 lane output.

SuggestedRemedy

Insert a PMA (4:20) immediately above the RS-FEC in Figure 83D-1

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D.1** *P* **139** *L* **31** # 180

Dudek, Mike QLogic

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

The RX-FEC is not a required interface.

SuggestedRemedy

Either add a table footnote 1 to RS-FEC. Footnote 1 to say "Note 1 RS-FEC and is conditional depending on the PMD type." or better show an alternative with the CAUI-4 just going to a PMA(4:4) above the PMD.

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D.3.1** *P* **141** *L* **33** # 181

Dudek, Mike QLogic

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

The common mode output return loss should be a minimum not a maximum (like the differential output return loss)

SuggestedRemedy

Change "max" to "min"

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D.3.1.4** *P* **144** *L* **7** # 182

Dudek, Mike QLogic

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

With the Transmitter being measured at TP0 close to the Transmitter there will be little need for measuring with the CTLE and with de-emphasis in the transmitter there is likely to be a need for some loss in the measurement instead.

SuggestedRemedy

Delete the reference to the CTLE and add an editors note to be removed prior to publication that the method for measuring the jitter in the presence of the de-emphasis required for maximum loss channels is under study.

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.1.3** *P* **159** *L* **26** # 183

Dudek, Mike QLogic

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

It is not clear what the Common to differential mode conversion is

SuggestedRemedy

Either add another sentence. "It is the ratio of the reflected differential signal to an incident common mode signal (cf SDC22)."
Or include return loss in the parameter name ie rename as "Common to Differential output return loss conversion"

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.2** *P* **163** *L* **46** # 184

Dudek, Mike QLogic

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

OIF has done a significant amount of work showing that the Vertical eye closure of 6.5dB over-stresses the receiver and is not needed by modules.

SuggestedRemedy

Reduce the value from 6.5dB to 5.5dB (the value chosen by OIF.

Proposed Response *Response Status* **O**

Cl **83** *SC* **83.5.6** *P* **59** *L* **48** # 185

Dudek, Mike QLogic

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

Annex 83E is for chip to module applications not chip to chip

SuggestedRemedy

Change from "chip-to-chip" to "chip-to-module"

Proposed Response *Response Status* **O**

Cl **85** *SC* **85.3** *P* **63** *L* **25** # 186

Dudek, Mike QLogic

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

It would be rather strange to use CAUI4 for the 10 lane 100GBASE-CR10, and Table 85-1 does not refer to CAUI-4

SuggestedRemedy

Consider whether this should be changed from "CAUI-n" to "CAUI-10" on lines 25 and 26. If this is not changed to CAUI-10 then in table 85-1 add an additional row 83D-CAUI-4, Not applicable, Optional.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.7** *P* **100** *L* **21** # 187

Ghiasi, Ali Broadcom

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

It is assumed that RS-FEC latency is acceptable for all application and/or RS-FEC implementation has no impact in large system configuration. Also in HPC and high frequency trading market, cusomter will end up engineering their own link by turning off the FEC.

SuggestedRemedy

Add following reach reaches to table 95-5, 0.5-20 m for OM3 fiber when RS-FEC is off and 0.5-30 m on OM4 fiber when RS-FEC is off

Proposed Response *Response Status* **W**

[Editors note: Subclause changed from 7 to 95.7]

Cl **95** *SC* **95.1.1** *P* **94** *L* **43** # 188

Dawe, Piers IPtronics

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

Can we help the PMD implementor understand when his errors "are not sufficiently random"?

SuggestedRemedy

Add more text or references to help the PMD implementor.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.7.1** *P* **100** *L* **48** # 189

Dawe, Piers IPtronics

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

40GBASE–SR4 has a peak power spec, which protects the receiver from overload. For compatibility as well as for 100GBASE–SR4 use, this spec should have the same limit.

SuggestedRemedy

If Clause 95 is kept as a separate specification for 100GBASE-SR4, insert:
Peak power, each lane (max) 4 dBm
(as in Table 86-6). Also add it to Table 95-7 (receiver table).
If a clearer definition of peak power is needed, define peak power as the level at which an eye mask measurement would give the usual hit ratio (5e-5).

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.7.1** *P* **100** *L* **52** # 190

Dawe, Piers IPtronics

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

Put the rows in a more logical order and/or the same as Clause 86.

SuggestedRemedy

If Clause 95 is kept as a separate specification for 100GBASE-SR4, move "Difference in launch power between any two lanes (max)" to just after the launch power max and min rows. Consider keeping "Average launch power of OFF transmitter, each lane (max)" just after it.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.7.1** *P* **101** *L* **16** # 191

Dawe, Piers IPtronics

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

Table note b, first sentence "Average launch power, each lane (min) is informative and not the principal indicator of signal strength." is not true for these spec limits

SuggestedRemedy

If Clause 95 is kept as a separate specification for 100GBASE-SR4, delete table note b in this Table 95-6 and in Table 95-7 (receiver table).

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.7.2** *P* **101** *L* **48** # 192

Dawe, Piers IPtronics

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

Add at least placeholders for the other stressed receiver sensitivity parameters.

SuggestedRemedy

Stressed eye J2 Jitter, each lane,
Stressed eye J4 Jitter, each lane,
OMA of each aggressor lane.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.7.2** *P* **101** *L* **49** # 193

Dawe, Piers IPtronics

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

Add conditions of receiver jitter tolerance test.

SuggestedRemedy

Conditions of receiver jitter tolerance test:
Jitter frequency and peak-to-peak amplitude — (190, 5) (kHz, UI)
Jitter frequency and peak-to-peak amplitude — (940, 1) (kHz, UI)
But compare with the equivalent test in 802.3bj.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.8** *P* **102** *L* **32** # 194

Dawe, Piers IPtronics

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

Most of 95.8 Definition of optical parameters and measurement methods is already stated in 86.8.

SuggestedRemedy

If Clause 95 is kept as a separate specification for 100GBASE-SR4, refer to 68.6 (use Table 95-10-Test-pattern definitions and related subclauses, perhaps with a name change) and list only the exceptions. Add rows for Skew, Skew Variation, eye mask. Delete most of the text in 95.8.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.8.1** *P* **102** *L* **41** # 195

Dawe, Piers IPtronics

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

A PMD such as this that uses Clause 91 "RS-FEC" encoded signals needs an equivalent of Pattern 5, scrambled idle.

SuggestedRemedy

Add pattern 6, RS-FEC encoded scrambled idle, and refer to it in place of Pattern 5 as appropriate. Point out that the "valid 100GBASE-R signal" is RS-FEC encoded.
Coordinate with 802.3bj as necessary.
Consider if an RS-FEC encoded scrambled Remote Fault would be an acceptable additional alternative (RF is what a transmitter will emit by default when it doesn't detect an input).
Editorial: as
Table 86-12/95-10-Test patterns and related subclauses
is getting unwieldy, consider making a column for each pattern and populating with yes/no in the style of Table 80-2.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.8.3** *P* **104** *L* **11** # 196

Dawe, Piers IPtronics

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

The test setup in Figure 53-6 isn't right for a parallel-fibre PMD.

SuggestedRemedy

If Clause 95 is kept as a separate specification for 100GBASE-SR4, delete ", per the test setup in Figure 53-6".

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.8.8** *P* **105** *L* **16** # 197

Dawe, Piers IPtronics

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

I don't remember a LF SJ mask in the SRS definition in the baseline. Anyway, it's probably preferable to use a separated jitter tolerance test for the same reasons that 86, 92, 93 and 94 do: SRS and SJ tolerance test different parts of a product, should be applied with different sampling strategies for cost-effectiveness, and each one makes the implementation of the other more complicated and expensive.
TR because it might take more than one meeting cycle to make a good decision if difficulties are found.

SuggestedRemedy

If Clause 95 is kept as a separate specification for 100GBASE-SR4, consider a separated jitter tolerance test. Compare to 802.3bj.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.9** *P* **105** *L* **35** # 198

Dawe, Piers IPtronics

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

Don't re-invent the wheel. Safety, installation, environment, and labeling should be just the same as for 40GBASE-SR4. However, 40GBASE-SR4 is Hazard Level 1M and this draft 100GBASE-SR4 has Hazard Level 1; surely they should be the same.

SuggestedRemedy

If Clause 95 is kept as a separate specification for 100GBASE-SR4, replace 95.9 with a reference to 86.9.
Resolve the Hazard Level discrepancy, making a maintenance request for 86.9.2 Laser safety if appropriate.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.9** *P* **108** *L* **23** # 199

Dawe, Piers IPtronics

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

The specs for Medium Dependent Interface (MDI) have got to be the same for 100GBASE-SR4 as for 40GBASE-SR4 as they can connect to the same fibre plant.

SuggestedRemedy

If Clause 95 is kept as a separate specification for 100GBASE-SR4, replace 95.11.3 Medium Dependent Interface (MDI) with a reference to 86.10.3 as for 40GBASE-SR4.
Nit: NOTE-Transmitter compliance testing is performed at TP2 as defined in 86.5.1/95.5.1, not at the MDI.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.12.4.1** *P* **112** *L* **9** # 200

Dawe, Piers IPtronics

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

The PMD is insulated from the PCS by the RS-FEC.

SuggestedRemedy

Change "Compatible with 100GBASE-R PCS and PMA" to "Compatible with 100GBASE-R RS-FEC and PMA".

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.12.4.4** *P* **114** *L* **30** # 201

Dawe, Piers IPtronics

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

As 95.8.1.1 says, stressed receiver sensitivity and receiver jitter tolerance are defined for an interface at the BER specified in 95.1.1 - not each lane separately. Need this for low test time/cost and ability to do FEC-aware testing.

SuggestedRemedy

If Clause 95 is kept as a separate specification for 100GBASE-SR4, change "Each lane" to something appropriate, e.g. "Method of 52.9.9 with exceptions listed".

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.10** *P* **10** *L* **38** # 202

Dawe, Piers IPtronics

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

The interaction between 95.10, Fiber optic cabling model, and 95.11, Characteristics of the fiber optic cabling (channel), seems un-optimum. 86.10, Optical channel, attempts to clean this up.

SuggestedRemedy

If Clause 95 is kept as a separate specification for 100GBASE-SR4, reconcile the differences.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95** *P* **93** *L* **1** # 203

Dawe, Piers IPtronics

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

We have now made enough decisions to see that 100GBASE-SR4 will have almost everything in common with 40GBASE-SR4.
It is essential that 100GBASE-SR4 and 40GBASE-SR4 are compatible and consistent with no unnecessary differences, which would add cost. The best way to ensure and demonstrate consistency is to use common specifications where appropriate. A careful review of Clause 95 and Clause 86 shows that almost everything can be common - in fact, 100GBASE-SR4 can be slotted into Clause 86 by adding columns to tables 86-1 2 6 (7) 8 9 12 and 13. (To show that this is practical, note that Fibre Channel habitually uses a PMD clause and tables with up to three signalling rates when the specification methodology is similar). It would still be practical to add any future 16 x 25G PMD into Clause 86.

SuggestedRemedy

Move the technical content of Clause 95 into Clause 87.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95** *P* **93** *L* **1** # 204

Dawe, Piers IPtronics

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

There are a variety of minor differences between the specification for 40GBASE-SR4 and this draft for 100GBASE-SR4. It looks like some are intentional, some are not (material copied from 40GBASE-LR4 that doesn't suit -SR4), and very few are necessary.

SuggestedRemedy

If Clause 95 is kept as a separate specification for 100GBASE-SR4, find all these differences using a comparison tool, review each one, align Clause 95 to Clause 86 wherever practical, submit maintenance requests for Clause 86 where an improvement is desired. Also make greater use of references to Clause 86 rather than (not quite?) copying material.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.1** *P* **93** *L* **46** # 205

Dawe, Piers IPtronics

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

Engineers hate 802.3 documents: very long and fragmented, full of jargon, hard to relate to their work. Leaving out the signposting text will make our efforts even less appreciated.

SuggestedRemedy

If Clause 95 is kept as a separate specification for 100GBASE-SR4, insert the same signposting text as in Clause 86, in the equivalent place:
"Further relevant information may be found in Clause 1 (terminology and conventions, references, definitions and abbreviations) and Annex A (bibliography, referenced as [B1], [B2], etc.)."

At the end of 95.1 before 95.1.1, insert:
This clause is arranged as follows: following the overview and an abstract description of the PMD service interface, delay and Skew specifications, control and status variables and registers, a block diagram and high-level specification of the PMD functions, and lane assignments, 95.7 contains the optical specifications for 100GBASE-SR4. 95.8 defines optical parameters. 95.9 addresses safety, installation, environment and labeling, 95.10 defines the optical channel, and 95.11 contains the PICS.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.1** *P* **93** *L* **47** # 206

Dawe, Piers IPtronics

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

Give the reader a break! Put the key facts near the beginning of the clause, as in 86.

SuggestedRemedy

If Clause 95 is kept as a separate specification for 100GBASE-SR4, insert:
The 100GBASE-SR4 PMD sublayer provides point-to-point 100 Gb/s Ethernet links over four pairs of multimode fiber, up to at least 100 m. Table 92–2 shows the primary attributes of this PMD type.
Table 95–2—Summary of 100GBASE–SR4

	100GBASE–SR4	Unit
Fiber type	50/125 um multimode, type A1a.2 a (OM3) or A1a.3 b (OM4)	
Number of fiber pairs	4	
Nominal wavelength	850	nm
Required operating range	0.5 to 70 for OM3 0.5 to 100 for OM4 c	m
Signaling rate, each lane	25.78125 +/-100 ppm	GBd

a Type A1a.2 (OM3) specified in IEC 60793-2-10. See 95.11.
b Type A1a.3 (OM4) specified in IEC 60793-2-10. See 95.11.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.3.2** *P* **95** *L* **40** # 207

Dawe, Piers IPtronics

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

Figure 80–4 and Figure 80–5 don't apply: we need Clause 91 "RS-FEC" and not more than 4 PMA lanes below it.

SuggestedRemedy

Change "Figure 80–4 and Figure 80–5" to Figure 80–5a".

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.5.4** *P* **98** *L* **31** # 208

Dawe, Piers IPtronics

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

The maximum signal detect threshold should be the minimum compliant signal power at the receiver, which is not "receiver sensitivity (max) in OMA in Table 95–7)" - and Table 95–7 intentionally does not contain a "receiver sensitivity (max) in OMA".

SuggestedRemedy

If a
Table m-n—Characteristics of signal within, and at the receiving end of, a compliant optical channel
is available, change "receiver sensitivity (max) in OMA in Table 95–7" to "Minimum OMA, each lane, in Table m–n)", else to "stressed receiver sensitivity (OMA), each lane (max) in Table 95–7)".

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.7** *P* **100** *L* **15** # 209

Dawe, Piers IPtronics

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

Missing signposting text.

SuggestedRemedy

If Clause 95 is kept as a separate specification for 100GBASE-SR4, insert:
The optical signal at the transmit and receive side of the MDI is specified in 95.7.1 and 95.7.3. The range of optical signals within the optical medium is defined in 86.7.2, and an illustrative link power budget is provided in 95.7.4.

Proposed Response *Response Status* **O**

Cl **95** *SC* **95.1.1** *P* **94** *L* **35** # 210

Dawe, Piers IPtronics

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

It's only in the receiver spec that BER shows up.

SuggestedRemedy

Move 95.1.1 to the definition of stressed receiver sensitivity.

Proposed Response *Response Status* **O**

Cl **00** *SC* **0** *P* **1** *L* **1** # 211

Dawe, Piers IPtronics

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

Editorials

SuggestedRemedy

To follow, if I have time.

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.1.6.1** *P* **162** *L* **6** # 212

Dawe, Piers IPtronics

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

Gratuitous clutter.

SuggestedRemedy

Remove 2pi (6 times in this section, 3 times in 83E.3.2.1.1), change Grad/s to GHz (twice in this section).

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.1.6.1** *P* **161** *L* **51** # 213

Dawe, Piers IPtronics

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

It would be better to define the reference receiver just once, in the parameter definitions section.

SuggestedRemedy

Move the definition of the reference receiver to 83E.4.2. Include the fourth-order Bessel-Thomson filter (see another comment).

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.3.3.1** *P* **168** *L* **39** # 214

Dawe, Piers IPtronics

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

Table has an entry for DCD. Do you mean DCD or EOJ? Anyway, how is this to be generated?

SuggestedRemedy

Delete the row. Similarly in Table 83E-10.

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.4.2** *P* **171** *L* **48** # 215

Dawe, Piers IPtronics

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

The project's overall BER objective is 1e-12, so 1e-13 is more than good enough for CAUI (see another comment) and it has been difficult to find suitable eye height and width limits for a non-OIF BER. But we can adjust the extrapolation to be more appropriate.

SuggestedRemedy

Instead of using EW15, use EW13 (extrapolated by same method, change 3.19 to 2.60) if not protected by RS-FEC, use EW6 (no extrapolation need) if protected by RS-FEC.

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.1** *P* **156** *L* **13** # 216

Dawe, Piers IPtronics

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

This annex uses "transmit" and "receive" in two different senses, e.g. "independent transmit and receive data paths" at line 5 and "Transmitter,
Receiver" in Figure 83E-2. This needs clearing up. 802.3ba had a similar problem in Annex 86A, which was resolved by using the terms host and module, input and output, for electrical ports and "transmit" and "receive" in the sense of line 5 (which I believe aligns with Clause 83 "Tx side, Rx side".

SuggestedRemedy

Throughout 83E, change transmitter to output, receiver to input.
It would be advisable to do the same in 83D, although 83D might not distinguish between Tx side and Rx side.

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.1** *P* **161** *L* **3** # 217

Dawe, Piers IPtronics

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

Note that transition time is defined as observed in a particular filter response. Clause 86's choice will be too slow. 802.3bj uses 33 GHz, OIF VSR following CEI uses 40 GHz which is too high for a representative measurement (much higher than real input bandwidths, expensive instrument). InfiniBand EDR is considering 30 GHz. For 25G lanes, 802.3ba and P802.bm optical specs use 19.34 GHz. This topic is open in P802.3bj.

SuggestedRemedy

Specify a suitable measurement bandwidth (33 GHz or below), adjusting the transition time if necessary to keep the same effect as OIF VSR's 10 ps in 40 GHz.
This affects several parameters, so it's best stated in a definition-of-parameters section.

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.1.6** *P* **161** *L* **13** # 218

Dawe, Piers IPtronics

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

Allowable test patterns should be as for similar parameters in Table 95-10.
For crosstalk generators, any of 3, 5, valid 100GBASE-R signal or valid RS-FEC encoded 100GBASE-R signal will be fine.
In the remedy, Pattern 6 would be RS-FEC encoded idle.

SuggestedRemedy

Change "a PRBS31 test pattern" to "a suitable mixed-frequency signal, e.g. Pattern 3, Pattern 5, Pattern 6, a valid 100GBASE-R signal or a valid RS-FEC encoded 100GBASE-R signal.

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.3.1** *P* **165** *L* **23** # 219

Dawe, Piers IPtronics

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

A BER spec of 1e-15 is too expensive to measure (takes too long), is not consistent with the project BER objective of 1e-12, and is completely wrong for 100GBASE-SR4 which uses FEC. Even 1e-13 is overkill because it's not feasible to manufacture links with consistently bad and uniform SNR, so links approaching the spec limit will be rare, so the chances of seeing several at-limit links in series are negligible. Hence the limit for CAUI-4 is 1e-12. But if folks aren't convinced by that, then a spec of 1e-13 means a test time of "only" several minutes rather than days.
The existence of a market for more-than-Ethernet equipment is no excuse for us getting this wrong.

SuggestedRemedy

Change 1e-15 to two options: 1e-13 for non-RS-FEC use and 1e-6 for with-RS-FEC use.

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.3.3.3** *P* **167** *L* **32** # 220

Dawe, Piers IPtronics

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

Need a sensible spec for use with RS-FEC.

SuggestedRemedy

Use two columns with BER max 1e-6 and 1e-13.
For 1e-6, specify EW6 and EH6. For now, use the limits that OIF uses for EW15 and EH15 - this gives all the benefit of a more reasonable BER limit to the input, but at least it's better than doing nothing.
For 1e-13, specify EW13 and EH13. Also use the limits that OIF uses for EW15 and EH15. Similarly for module stressed input (Table 83E-9).

Proposed Response *Response Status* **O**

Cl **83E** *SC* **83E.4.2** *P* **171** *L* **27** # 221

Dawe, Piers IPtronics

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

Reference receiver also includes a fourth-order Bessel-Thomson filter (see another comment).

SuggestedRemedy

Include the fourth-order Bessel-Thomson filter.

Proposed Response *Response Status* **O**

Cl **83D** *SC* **83D.3.1** *P* **141** *L* **30** # 222

Dawe, Piers IPtronics

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

To keep this VSR-compatible (chip-module CAUI compatible) the far end pk-pk voltage must not exceed 900 mV.

SuggestedRemedy

In 83D.3.1.1, The peak-to-peak differential output voltage shall be less than or equal to 900 mV for the "low" transmit equalizer setting. The VMA shall not exceed 900 mV for any transmit equalizer setting.

Proposed Response *Response Status* **W**

[Editor's note: This comment was sent after the close of the comment period]