If local clock frequencies are different, line-side loopback at bit-level requires that TX path be clocked using RX (recovered) clock instead of local clock in normal operation (buffering cannot work at bit-level). This is not guaranteed to meet TX jitter spec and may prevent remote RX from receiving correct data, although both one-way paths are fully operational. Therefore, this test mode is over-stressing.

Suggested Remedy
Delete subclauses 45.2.1.1.4a and 83.5.8

Response
ACCEPT IN PRINCIPLE.

[Editor's note: Comment also applies to Clause 83]

The line side loopback was added as the resolution to comment #643 in D1.0. Leave the optional line loopback in, but make a statement about not required to meet all transmit jitter specifications in line loopback, editorial license to fit the text in to the clause.

Suggested Remedy
Remove line 21 and/or rephrase paragraph

Response
ACCEPT IN PRINCIPLE.

Data dependent pulse width shrinkage is due to ISI and can be dealt with using equalization in either RX or TX side. Adaptive equalization is assumed in KR and should also be assumed in CR4, CR10. Therefore, only DCD in 1010 pattern (which is not solved by equalization) should be specified.

Suggested Remedy
remove editor's note and do not address data dependent pulse width.

Response
ACCEPT IN PRINCIPLE. See remedy in comment #284.

Please use the mask per definition of ghiasi_01_0708

\[
\text{SDD21} = -0.108 - 0.845 \sqrt{f} - 0.802f \text{ from 0.01 to 7 GHz}
\]

\[
\text{SDD21} = 20 - 4f \text{ from 7 to 8 GHz}
\]

\[
\text{SDD21} = -21 \text{ dB from 8 to 11.1 GHz}
\]

Also see ghiasi_01_0109

Response
ACCEPT IN PRINCIPLE.

Refer to ghiasi_02_0109.pdf page 5 MCB limit -0.0006-0.16\sqrt{f}-0.0587(f) from 0.25 to 11.1 GHz.
Comment Type TR  Comment Status R  compliance point
XLAUI/CAUI in addition to loss definition it also require min return loss definition.

SuggestedRemedy
Per ghiasi_01_0708 page 16
SDD11=-12.5 dB from 0.01 to 5 Gzh
SDD11=-12.5 + 27.5*log10(f/5) f is from 0.01 to 5 to 11.1 GHz

Response  Response Status C  REJECT.
This comment was WITHDRAWN by the commenter.

Already defined in 83A-2

Comment Type TR  Comment Status A  de-emphasis
To guarantee interoperability min transmitter pre-emphasis must be defined

SuggestedRemedy
xAUI transmitter at compliance point near end must have 3.5 dB of de-emphasis
see ghiasi_01_0109

Response  Response Status C  ACCEPT.
Additional de-emphasis would provide more margin in high loss case.
See remedy in comment#54.

Comment Type TR  Comment Status R  compliance points
I submitted a comment to add label on the transmit and receive compliance points

SuggestedRemedy
I suggest we use label A and B
Response  Response Status C  REJECT.
If we require labels, consider using TP style
This comment was WITHDRAWN by the commenter.

Jitter methodology need to be updated

SuggestedRemedy
In both SFP+ and CL 86 we have moved away from dual dirac DJ definition since DJ amount can go down as RJ is increased. Instead of breaking down the jitter components these group have just defined TJ at BER1E-2 as replacement for DJ and J12 as the TJ at 1E-12. Please see ghiasi_01_0109 for more details

Base on the above definition
then TJ(J12)=0.3 UI (to support BER 1E-15) otherwise it would be 0.32
J2=0.19 UI replacing DJ
Add DDPWS=0.1 UI when measured with PRBS9

Response  Response Status C  REJECT.
This comment was WITHDRAWN by the commenter.

DJ / RJ continues to be used through out the document (CL84, CL85, CL87, CL88) and has served more than adequately as a jitter methodology for many years.
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Commenter</th>
<th>Comment</th>
<th>Response</th>
<th>Response Status</th>
<th>Response</th>
<th>Comment Status</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>53</td>
<td>TR/technical required</td>
<td>A</td>
<td>Broadcom</td>
<td>To guarantee min eye opening at the receiver the transmitter output VMA or eye opening with de-emphasis must be defined</td>
<td>SuggestedRemedy</td>
<td>Propose to define min vertical eye opening=280 mV diff p-p with de-emphasis</td>
<td>ACCEPT IN PRINCIPLE.</td>
<td>Y1 value should be used to specify the minimum vertical eye opening.</td>
<td>See remedy in 54 for y1.</td>
</tr>
<tr>
<td>54</td>
<td>TR/technical required</td>
<td>A</td>
<td>Broadcom</td>
<td>Min receiver eye opening can not be guaranteed with min transmitter level and slow rise time and fall time</td>
<td>SuggestedRemedy</td>
<td>Y2=−16 + 9*[min (tr,tf)], tr/τf are 20-80% in ps</td>
<td>ACCEPT IN PRINCIPLE.</td>
<td>Updated equation required.</td>
<td>See comment 52</td>
</tr>
<tr>
<td>55</td>
<td>TR/technical required</td>
<td>R</td>
<td>Broadcom</td>
<td>Jitter methodology need to be updated</td>
<td>SuggestedRemedy</td>
<td>In both SFP+ and CL 86 we have moved away from dual dirac DJ definition since DJ amount can go down as RJ is increased. Instead of breaking down the jitter components these group have just defined TJ at BER1E-2 as replacement for DJ and J12 as the TJ at 1E-12. Please see ghiasi_01_0109 for more details</td>
<td>REJECT.</td>
<td>This comment was WITHDRAWN by the commenter.</td>
<td></td>
</tr>
<tr>
<td>56</td>
<td>TR/technical required</td>
<td>A</td>
<td>Broadcom</td>
<td>Sine xAUI has defined mandatory de-emphasis there is little benefit to define non-EQJ which is difficult parameter to test or verify</td>
<td>SuggestedRemedy</td>
<td>Replace non-EQJ with J2=0.48 UI</td>
<td>ACCEPT IN PRINCIPLE.</td>
<td>Remedy in comment#255</td>
<td></td>
</tr>
</tbody>
</table>
Comment Type TR  Comment Status R  jitter
no-EQJ require definition of channel s-parameter response too much complications when
xAUI defines transmit de-emphasis

Suggested Remedy
Replace non-EQJ with TJ(J2) value of 0.48 UI
and TJ(J12)=0.62 UI and J15=0.85 UI

Response  Response Status C
REJECT.
This comment was WITHDRAWN by the commenter.

Modify non-EQJ to DJ. Additional input on E-15 operation required (additional section).

Comment Type TR  Comment Status A  jitter
Optional operation at BER 1E-15

Suggested Remedy
A receiver capable of operating at stress jitter tolerance of TJ(J12)=0.65 UI would have
sufficient margin for operation at BER 1E-15 since the max TJ(J12) from the worst case
channel is TJ(J12)=0.62 UI
see ghiasi_01_0109

Response  Response Status C
ACCEPT IN PRINCIPLE.
Under BER subclause:
Add Note: A transmitter capable of operating at TJ = 0.30 UI and DJ = 0.16 UI and receiver
capable of operating at stress jitter tolerance of TJ=0.64UI and DJ= 0.41 UI would have
sufficient margin for operation at approximately BER 1E-15.

see ghiasi_01_0109

Comment Type TR  Comment Status A  channel
XLAIU/CAUI in addition to loss definition it also require min return loss definition.

Suggested Remedy
Per ghiasi_01_0708 page 16
SDD11= -12.5 dB from 0.01 to 5 Ghz
SDD11= -12.5 + 27.5*log10(f/5) f is from 0.01 to 5 to 11.1 GHz

Response  Response Status C
ACCEPT.
Per ghiasi_01_0708 page 16
SDD11= -12.5 dB from 0.01 to 5 Ghz
SDD11= -12.5 + 27.5*log10(f/5) f is from 5 to 11.1 GHz

SDD11= -12.5 + 27.5*log10(f/5) f is from 11.1 GHz

Also see ghiasi_01_0109

Response  Response Status C
ACCEPT IN PRINCIPLE.
Under BER subclause:
Add Note: A transmitter capable of operating at TJ = 0.30 UI and DJ = 0.16 UI and receiver
capable of operating at stress jitter tolerance of TJ=0.64UI and DJ= 0.41 UI would have
sufficient margin for operation at approximately BER 1E-15.

see ghiasi_01_0109

Note: 2.5 dB receive eye margin is allocated to account for crosstalk and reflection
penalties.
Update receiver eye with Y=45 to Y=42.5
Comment Type TR Comment Status A
Editor note on the location of the AC coupling

SuggestedRemedy
All cable assembly shall incorporate AC coupling between TP3 and MDI on the receive function with 0.1 uf capacitor.

Response Response Status C
ACCEPT IN PRINCIPLE.

See remedy in comment#285.

Comment Type TR Comment Status A
TP2 test method missing

SuggestedRemedy
PPI test method of the CL 86 can be used to test CR4/CR10 please see ghiasi_02_0109 for the PPI detail proposal.

Response Response Status C
ACCEPT IN PRINCIPLE.

Comment #62 TP2 transmitter to be specified utilizing valliappan_01_0109.pdf slide 2 table Tx specification @ TP2.

Comment Type TR Comment Status A
DDPWS not included in current DCD value

SuggestedRemedy
Copy 86.7.4.4 for definition and test method of DDPWS and with value of 0.07 UI

Response Response Status C
ACCEPT.

See comment#284 for rationale.
IEEE P802.3ba D1.1 40Gb/s and 100Gb/s Ethernet comments
Task force Review

Comment Type: TR  Comment Status: A

TP0 specifications are missing

Suggested Remedy:
Duplicate table 85-4 at TP0 with following row:
- Signaling speed - same
- Unit interval - same
- Differential output voltage - same
- Common mode voltage limit - same
- Differential Output return loss - see ghiasi_03_0109
- Common mode output voltage - 12 mV RMS
- Transition time - 24 ps min

Response: C
ACCEPT IN PRINCIPLE.

See suggested remedy comment#307.

Comment Type: TR  Comment Status: A

Table 85-5 is missing Differential to common mode conversion

Suggested Remedy:
Add row to table 85-5 for SCD11 with value of -10 dB max from 0.01 to 11.1 GHz

Response: C
ACCEPT IN PRINCIPLE.

Add row to table 85-5 for SCD11 with value of -10 dB max from 0.01 to 11.1 GHz

Response: C
ACCEPT IN PRINCIPLE.

Current ILPCB limit Eq 85-1 only allow about 5" of PCB traces on FR-6 not meeting nicole_01_0708 objective of 4". Transmit and receive PCB loss each must be specified with max limit.

Suggested Remedy:
Propose to allocate 3.5 dB of loss for the TX and RX PCB loss to allow 4" on FR4-6 or 6" on FR4-13. Change 0.2032 to 0.15 then the loss for both TX and RX are given by EQ 85-1

Response: C
REJECT.

The copper length objective for 40 and 100 Gigabit Ethernet is at least 10 m over a copper cable assembly.

Current PCB loss limit Eq 85-1 allows for 8" of PCB trace meeting nicole_01_0708 objective. ILpcbmax represents 8 inches (0.2032 m) of the maximum fitted attenuation Amax due to trace skin effect and dielectric properties as defined in Annex 69B.4.2.
Comment Type: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID

---

**Comment ID # 70**

Cl  85  SC  85.10  P  229  L  10  #  70
Ghiasi, Ali  Broadcom

**Comment Type** TR  **Comment Status** R
Cable missing pulse response or group delay, this is required for development of comprehensive stress generator as well as non compliant cables

**Suggested Remedy**
Please add pulse response for the cable, for response see ghiasi_03_0109

**Response**  **Response Status** C
REJECT.

This comment was WITHDRAWN by the commenter.

Pulse response provided is not sufficient i.e., it's not the pulse response of minimally compliant CR4/CR10 cable assembly.

---

**Comment ID # 71**

Cl  85  SC  85.10  P  229  L  13  #  71
Ghiasi, Ali  Broadcom

**Comment Type** TR  **Comment Status** R
Retrun loss missing

**Suggested Remedy**
Add differential return loss=-12 + 2*sqrt(f) f from 0.01 to 4.1 GHz
= -6.3 + 13*log10(f/5.5) from 4.1 to 11.1 GHz
Add common more return loss = -7.51 + 1.1 *f from 0.01 to 4.1 GHz and -3 dB from 4.1 to 11.1 GHz

**Response**  **Response Status** C
REJECT.

This comment was WITHDRAWN by the commenter.

Differential return loss specified. See remedy comment#663.

Common mode return loss proposal insufficiently supported or justified.

---

**Comment ID # 73**

Cl  85  SC  85.8.4  P  226  L  50  #  73
Ghiasi, Ali  Broadcom

**Comment Type** TR  **Comment Status** R
Comperehensive stress receiver is requried for both TP0 and TP3

**Suggested Remedy**
Please see ghiasi_03_0109 for block diagram and test method for comprehensive receiver test method

**Response**  **Response Status** C
REJECT.

This comment was WITHDRAWN by the commenter.

See presentation material to be submitted in support of Clause 85 Draft 1.1. comment resolutions and ghiasi_03_0109.pdf.
Table 85-4 is missing common mode output voltage limit, since the connector and the
cable are guided differential mode excess common mode from the driver may result in
unacceptable BER and EMI

Suggested Remedy
Add row to table 85-4
Output AC common mode voltage with max value of 15 mV RMS

ACCEPT IN PRINCIPLE.

Add row to table 85-4
Output AC common mode voltage with max value of 30 mV RMS

Comment Type: TR
Comment Status: A

Ghiasi, Ali Broadcom

Optical lane assignment are missing

Suggested Remedy
Please see ghiasi_02_010 for detail diagrams. Fibre # need to be added to figure 86-2 and
a diagram need to be created for connector lane and fiber number.

ACCEPT IN PRINCIPLE.

See response to 186 and 187

Comment Type: TR
Comment Status: A

Ghiasi, Ali Broadcom

Optical lane assignment are missing

Suggested Remedy
Please see ghiasi_02_010 for detail diagrams. Fibre # need to be added to figure 86-2 and
a diagram need to be created for connector lane and fiber number.

ACCEPT IN PRINCIPLE.

See response to 186 and 187

SDD11 = -12 + 2*SQRT(f) from 0.01 to 4.1 GHz
SDD11 = -6.3 + 13*log10(f/5.5) from 4.1 to 11.1 GHz

ACCEPT IN PRINCIPLE.

The existing equation is in three sections not two, editor will rewrite as three sections with
break points as implied by existing equation.
Comment Type: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID
Comment Type: TR
Comment Status: A

Max and min SDD21/12 need to defined based on meeting of 4" of PCB board and accounting for worst case HCB loss

Suggested Remedy:
Propose to use max loss of SDD21=-0.0929 -0.7267*sqrt(f) - 0.6897*f from 0.01 to 7 GHz
SDD21 = -29.39 - 5.16* f from 7 to 8 GHz
SDD21 = -14 dB from 8 GHz to 11.1 GHz

Min loss of SDD21=0.5 -0.5*f from 1 to 7 GHz
SDD21=-3 dB from 7 to 11.1 GHz
see ghiasi_02_0109

Response: Response Status: C

ACCEPT IN PRINCIPLE.

use max loss of host channel, connector and HCB of SDD21=-0.0929 -0.7267*sqrt(f) - 0.6897*f from 0.01 to 7 GHz
SDD21 = -29.39 - 5.16* f from 7 to 8 GHz
SDD21 = -14 dB from 8 GHz to 11.1 GHz

Min loss of SDD21=0.5 -0.5*f from 1 to 7 GHz
SDD21=-3 dB from 7 to 11.1 GHz
see ghiasi_02_0109

Add sentence to state that the Max host channel loss at 5.15625 GHz is 3.5 dB
(see ghiasi_02_0109)

Comment Type: E
Comment Status: A

Renumber subclause 84.2.1.4 to 84.2.2

Suggested Remedy:
As above

Response: Response Status: C

ACCEPT.

Also see comment 500
Add lane by lane transmit disable similar to the one defined in Clause 85

As above

Line 22 change 'uses' to 'shall use'
Line 37 change 'is' to 'shall be'
Line 41 change 'are' to 'shall be'
Page 207 line 3 change 'are' to 'shall be'
also change PICS as necessary

Line 22 change 'are' to 'shall be'
also line 32 change 'are' to 'shall be'
also see comment 364 and 365

Add a new Table 87-8 40GBASE-LR4 Receive Characteristics entry:

Add a new Table 87-7 40GBASE-LR4 Transmit Characteristics table entry:

40GBASE-LR4 Transmit Characteristics specifies:
Average Launch Power per Lane (max) 2.3dBm
However, there is no practical limit specified on Launch Power to limit Receiver TIA overload requirements.

40GBASE-LR4 Receive Characteristics specifies:
Average receive power, per lane (max) 2.3dBm
However, there is no practical limit specified to limit Receiver TIA overload requirements.
Comment Type: T  Comment Status: A
Table 87-7 40GBASE-LR4 Transmit Characteristics specifies no limit on Difference in Launch power between any two lanes (max), to limit Receiver cross-talk requirements.

SuggestedRemedy
Add a new Table 87-7 40GBASE-LR4 Transmit Characteristics table entry:
Difference in launch power between any two lanes (Average and OMA) (max) 6.5dB
Response Response Status: C
ACCEPT IN PRINCIPLE.
Add a new row to Table 87-7 for Difference in launch power (OMA) between any two lanes (max) with a value of 6.5dB
see also comment 93

[Editor's note: Corrected clause number and page: This comment refers to Clause 87 and page number 290]

Comment Type: T  Comment Status: A
Table 88-7 100GBASE-LR4 Transmit Characteristics specifies no limit on Difference in Launch power between any two lanes (max), to limit Receiver cross-talk requirements.

SuggestedRemedy
Add a new Table 88-7 100GBASE-LR4 Transmit Characteristics entry:
Difference in launch power between any two lanes (Average and OMA) (max) 5.0dB
Response Response Status: C
ACCEPT IN PRINCIPLE.
[Editor's note: Clause number set to 88]
Add a row to Table 88-7 for Difference in launch power between any two lanes (OMA) (max) with a value of 5.0dB
see also comment 116.

Comment Type: T  Comment Status: A
Table 88-8 100GBASE-LR4 Receive Characteristics specifies no limit on Difference in launch power between any two lanes (max), to limit Receiver cross-talk requirements.

SuggestedRemedy
Add a new Table 88-8 100GBASE-LR4 Receive Characteristics entry:
Difference in receive power between any two lanes (Average and OMA) (max) 5.5dB
Response Response Status: C
ACCEPT IN PRINCIPLE.
[Editor's note: Clause number set to 88]
Add a row to Table 88-8 for Difference in receive power between any two lanes (OMA) (max) with a value of 5.5dB
Table 88-11 100GBASE-ER4 Transmit Characteristics specifies a limit on:

- Difference in launch power between any two lanes (max) 3.0dB

   to limit SOA crosstalk requirements. This limit has been found difficult to support in practical transmitter implementations.

**Suggested Remedy**

Change Table 88-11 100GBASE-ER4 Transmit Characteristics entry to:

- Difference in launch power between any two lanes (Average and OMA) (max) 3.6dB

**Response**

ACCEPT.

[Editor’s note: Clause number set to 88 and missing comment type set to T]

Table 88-12 100GBASE-ER4 Receive Characteristics specifies:

- Difference in launch power between any two lanes (max) 4.0dB

   to limit SOA cross-talk requirements. This limit has been found difficult to support in practical transmitter implementations.

**Suggested Remedy**

Change Table 88-12 100GBASE-ER4 Receive Characteristics entry to:

- Difference in receive power between any two lanes (Average and OMA) (max) 4.5dB

**Response**

ACCEPT.

[Editor’s note: Clause number set to 88 and missing comment type set to T]
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Type</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>Status</th>
<th>Type</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>103</td>
<td>103</td>
<td>266</td>
<td>24</td>
<td></td>
<td></td>
<td>103</td>
<td>266</td>
<td>24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>104</td>
<td>104</td>
<td>268</td>
<td>37</td>
<td></td>
<td></td>
<td>104</td>
<td>268</td>
<td>37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>105</td>
<td>105</td>
<td>284</td>
<td>51</td>
<td></td>
<td></td>
<td>105</td>
<td>284</td>
<td>51</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Comment 103**

- **Type**: T
- **SC**: 86.7.4.3
- **P**: 266
- **L**: 24
- **Status**: A

Comment Type: T  Comment Status: A

"In this case the 1% level and...

Suggested Remedy:
change to:
"In this case the 0% level and..." (the ZeroLevel is 0%)

Response: C  Response Status: C

ACCEPT IN PRINCIPLE.
See Response to comment 566.

---

**Comment 104**

- **Type**: T
- **SC**: 86.7.5.7.1
- **P**: 268
- **L**: 37
- **Status**: A

Comment Type: T  Comment Status: A

Equation (86-9) appears "clipped" in that the leading symbol and trailing symbols are not clearly seen.

Suggested Remedy:
- make the leading symbol be "y"
- make the trailing symbol be "GHz"

[now matches equation (52-3)]

Response: C  Response Status: C

ACCEPT.

---

**Comment 105**

- **Type**: T
- **SC**: 87.7.1
- **P**: 284
- **L**: 51
- **Status**: A

Comment Type: T  Comment Status: A

Nonsensical reference:
"The PMD block diagram is shown in Figure 87-1."

Suggested Remedy:
replace with:
"The PMD block diagram is shown in Figure 87-2."

Response: C  Response Status: C

ACCEPT.

---

**Comment 106**

- **Type**: T
- **SC**: 87.5
- **P**: 284
- **L**: 51
- **Status**: R

Comment Type: T  Comment Status: R

The PMD service interface in Figure 87-2 is similar to that of Figure 86-2 so why not have the PPI interface of section 86 (40G version) available as the physically instantiated PMD service interface for 40GBASE-LR4?

Suggested Remedy:
Copy where possible, sections of 86 relating to the PPI or
Make references to those sections in 86 relating to PPI

Response: C  Response Status: R

REJECT.
Insufficient detail has been provided. Detailed proposals for how this would be implemented in the draft would be required.

---

**Comment 107**

- **Type**: E
- **SC**: 87.7.1
- **P**: 290
- **L**: 7
- **Status**: R

Comment Type: E  Comment Status: R

It is good practice not to duplicate values in multiple places, in particular, there are multiple places where wavelength ranges are given.

Suggested Remedy:
instead of using 4 lines of wavelength ranges, simply replace with:
"see Table 87-5"

Response: C  Response Status: R

REJECT.
The existing format allows the reader of the tables a more complete view of the Tx or Rx requirements

[Editor's note: Changed to subclause 87.7.1 from Table 87-7]
Comment Type: E  Comment Status: A
"Transmitter and dispersion penalty, each lane(min)" is a variation in wording from elsewhere, leading to possible confusion.

SuggestedRemedy
replace with:
"Transmitter and dispersion penalty (TDP), each lane(min)"

"(TDP)" inserted

Response  Response Status: C
ACCEPT IN PRINCIPLE.
See Response to comment 605

[Editor's note: Changed to subclause 87.7.1 from Table 87-7]

Comment Type: T  Comment Status: A
The TBD should be removed

SuggestedRemedy
replace TBD with PRBS9 and do this elsewhere for the short test pattern such as commeneted for page 193

Response  Response Status: C
ACCEPT IN PRINCIPLE.
See response to comment 438

Comment Type: T  Comment Status: A
The OMA measurement has become less variable than what is given in 52.9.5 with the LRM and SFP+ work.

SuggestedRemedy
Can add a sentence that the test pattern is to be a square wave consisting of 8 zeros and 8 ones. [NOT just N zeros and N ones where N is in the range of 4 to 11]

Response  Response Status: C
ACCEPT IN PRINCIPLE.
Pattern to be used is 8 ones, 8 zeros
See Response to comment 438
Several references are made to Clause 53 which is not applicable because Clause 53 assumes a transmission code that is 8B/10B.

Suggested Remedy:

References instead to Clauses 49, 51, 52 or to LRM would be better.

Could call out specifically the test pattern: PRBS31 should be used.

Response: Response Status: C

ACCEPT IN PRINCIPLE.

Change "as described in 53.9.14 with added sinusoidal jitter as specified in Table 87-13 and the stressed eye jitter and vertical eye closure penalty given in Table 87-8 for 40GBASE-LR4" to "as described in 53.9.14 with the exceptions that: added sinusoidal jitter is as specified in Table 87-13 the stressed eye jitter and vertical eye closure penalty are as given in Table 87-8 for 40GBASE-LR4 the test pattern given in Table 87-11"

give editorial licence to clean up as appropriate.

It is a bad practice to have variable values duplicated in several places.

Suggested Remedy:

Replace the 4 wavelength ranges given by "see Table 88-5" by:

"It is bad practice to have duplicate values for parameters in several places.

Suggested Remedy:

Replace the 4 wavelength ranges given by "see Table 88-5"

Response: Response Status: C

REJECT.

[Editor's note: Subclause field changed from Table 88-7 to 88.7.1]

The existing format allows the reader of the tables a more complete view of the Tx or Rx requirements

It should not be an entry for "Difference in receive power between any two lanes (max)"?

Suggested Remedy:

Add such an entry with a value (4 dB)?

Response: Response Status: C

ACCEPT IN PRINCIPLE.

[Editor's note: Subclause field changed from Table 88-8 to 88.7.2]

See response to comment 97
Cl 88 SC 88.8.1 P 319 L 7 # 119
Bergmann, Ernie Circadiant/JDSU
Comment Type T Comment Status R
It is bad practice to duplicate values for parameters in several places.
Suggested Remedy
Replace 4 entries of wavelength ranges with: "see Table 88-5".
Response Response Status C
REJECT.
[Editor's note: Subclause field changed from Table 88-11 to 88.8.1]
The existing format allows the reader of the tables a more complete view of the Tx or Rx requirements

Cl 88 SC 88.7.1 P 316 L 24 # 120
Bergmann, Ernie Circadiant/JDSU
Comment Type E Comment Status A
"Transmitter and dispersion penalty, each lane (max)"
Suggested Remedy
replace with:
"Transmitter and dispersion penalty (TDP), each lane (max)"
[inserted "(TDP)"]
Response Response Status C
ACCEPT IN PRINCIPLE.
[Editor's note: Subclause field changed from Table 88-7 to 88.7.1]
See Response to comment 605

Cl 88 SC 88.8.1 P 319 L # 121
Bergmann, Ernie Circadiant/JDSU
Comment Type T Comment Status A
There is no TDP specification in this table, but one would expect one in analogy to Table 88-7 and the reference to a measurement for it in 88.9.5, page 322, line 46,
Suggested Remedy
Add an entry:
"Transmitter and dispersion penalty (TDP), each lane (max)" with a value (2.2 dB?)
Response Response Status C
ACCEPT IN PRINCIPLE.
[Editor's note: Subclause field changed from Table 88-11 to 88.8.1]
See response to comment 491

Cl 88 SC 88.8.2 P 320 L 7 # 122
Bergmann, Ernie Circadiant/JDSU
Comment Type T Comment Status R
It is bad practice to have multiple locations where the same parametric value is specified.
Suggested Remedy
Replace the 4 wavelength range entries with "see table 88-5".
Response Response Status C
REJECT.
[Editor's note: Subclause field changed from Table 88-12 to 88.8.2]
The existing format allows the reader of the tables a more complete view of the Tx or Rx requirements

Cl 88 SC 88.9.1 P 321 L 40 # 123
Bergmann, Ernie Circadiant/JDSU
Comment Type T Comment Status A
Remove TBD for short test pattern
Suggested Remedy
replace TBD with PRBS9 to match other Standards work such as LRM and SFP+
Response Response Status C
ACCEPT IN PRINCIPLE.
[Editor's note: Subclause field changed from Table 88-14 to 88.9.1]
See response to comment 439
See also comments 221, 235, 109

Cl 45 SC 45.2.1 P 37 L 9 # 124
Barrass, Hugh Cisco
Comment Type E Comment Status A
MMD1 - missingspace
Suggested Remedy
add a space
Response Response Status C
ACCEPT.
See also #192
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>CL</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
<th>Type</th>
<th>Comment</th>
<th>Suggested Remedy</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>125</td>
<td>45</td>
<td>45.2.1</td>
<td>37</td>
<td>9</td>
<td></td>
<td>E</td>
<td>45.2, Table 45-2.</td>
<td>Change to a reference - Table 45-2</td>
<td>ACCEPT.</td>
</tr>
<tr>
<td>126</td>
<td>45</td>
<td>45.2.1</td>
<td>37</td>
<td>12</td>
<td></td>
<td>E</td>
<td>Editor's note asks a question...</td>
<td>The answer is &quot;no&quot;</td>
<td>Delete the editor's note</td>
</tr>
<tr>
<td>127</td>
<td>45</td>
<td>45.2.1</td>
<td>37</td>
<td>45</td>
<td></td>
<td>T</td>
<td>Two sets of registers are needed for PRBS error counters.</td>
<td>Change register names from PRBS31 to PRBS</td>
<td>ACCEPT.</td>
</tr>
<tr>
<td>128</td>
<td>45</td>
<td>45.2.1.12b</td>
<td>50</td>
<td>46</td>
<td></td>
<td>T</td>
<td>Title of register needs to change</td>
<td>Change PRBS31 to PRBS</td>
<td>ACCEPT IN PRINCIPLE.</td>
</tr>
</tbody>
</table>

**Note:**
- ACCEPT indicates the change has been accepted.
- ACCEPT IN PRINCIPLE indicates the change is accepted in principle but may require further clarification.
- The response status is C for closed.
- The comment type is E for editorial, T for technical, and G for general.
- The comment status is A for accepted, R for rejected, and D for dispatched.
Cl 45 SC 45.2.1.12b P 51 L 10 # [131]
Barrass, Hugh Cisco

Comment Type T Comment Status A
Table 45-12b and associated text needs to change to accommodate PRBS31 & PRBS9, with generate and check in both directions.

Suggested Remedy
Change Table 45-12b so that the bit assignments are as follows:

- 15 - PRBS pattern ability
- 14 - PRBS31 ability
- 13 - PRBS9 ability
- 11 - Tx generator ability
- 10 - Tx checker ability
- 9 - Rx generator ability
- 8 - Rx checker ability
- 7 PRBS31 enable
- 6 PRBS9 enable
- 3 Tx generator enable
- 2 Tx checker enable
- 1 Rx generator enable
- 0 Rx checker enable

Replace the text following the table as follows:

Register 1.19, bit 14 indicates that the device supports PRBS31 generation or checking. Register 1.19, bit 13 indicates that the device supports PRBS9 generation or checking. In both cases, if the device indicates support for the PRBS type, then it shall support that test for all of the generator and checker types that are indicated by the assertion of bits 11:8.

Register 1.19, bit 11 indicates that the device supports PRBS generation in the transmit direction. Register 1.19, bit 10 indicates that the device supports PRBS checking in the transmit direction. Register 1.19, bit 9 indicates that the device supports PRBS generation in the receive direction. Register 1.19, bit 8 indicates that the device supports PRBS checking in the receive direction.

Register 1.19, bit 7 enables testing with the PRBS31 pattern defined in 83.6.7. Register 1.19, bit 6 enables testing with the PRBS9 pattern defined in 83.6.7. The assertion of register 1.19 bits 7 and 6 is mutually exclusive. If both bits are asserted the behavior is undefined. The assertion of register 1.19, bits 7 and 6 works in conjunction with register 1.19, bits 3:0. If none of the bits 3:0 are asserted then bits 7 and 6 have no effect.

Register 1.19, bit 3 enables PRBS generation in the transmit direction. Register 1.19, bit 2 enables PRBS checking in the transmit direction. Register 1.19, bit 1 enables PRBS generation in the receive direction. Register 1.19, bit 0 enables PRBS checking in the receive direction.

Response Response Status C
ACCEPT.

Cl 45 SC 45.2.1.12c P 51 L 25 # [132]
Barrass, Hugh Cisco

Comment Type T Comment Status A
Register name needs to change

Suggested Remedy
Change PRBS31 to PRBS Tx

Title, 7 instances in text, 1 Table title.

Response Response Status C
ACCEPT.

Cl 45 SC 45.2.1.12c P 51 L 49 # [133]
Barrass, Hugh Cisco

Comment Type T Comment Status A
Add a set of registers for Rx direction error counters.

Suggested Remedy
Add subclause 45.2.1.12d

PRBS Rx pattern testing error counter (Register 1.30, 1.31, 1.32, 1.33, 1.34, 1.35, 1.36, 1.37, 1.38, 1.39)

The PRBS Rx pattern testing error counter registers are used for PHY types that implement PRBS pattern testing in the PMA. This function is described in 83.6.7. The assignment of bits in the PRBS Rx pattern testing error counter registers is identical to the PRBS Tx pattern testing error counter as shown in Table 45-12c. Register 1.30 contains the PRBS pattern testing error counter for lane 0, register 1.31 contains the PRBS pattern testing error counter for lane 1, and registers 1.22 through 1.29 contain the PRBS pattern testing error counters for lanes 2 through 9 respectively. Counters corresponding to lanes that are not implemented in a PMA shall read all zeroes.

The PRBS Rx pattern testing error counter is a twelve bit count as defined in 83.6.7. These bits shall be reset to all zeros when the register is read by the management function or upon execution of the PMA reset. These bits shall be held at all ones in the case of overflow.

Response Response Status C
ACCEPT.
Response #134

Cl 45 SC 45.2.1.12c P 51 L 32 # 134
Barrass, Hugh Cisco

Comment Type E Comment Status A
Double period..

SuggestedRemedy
Delete one of the periods.

Response Response Status C
ACCEPT.

Response #135

Cl 83 SC 83.5.7 P 192 L 9 # 135
Barrass, Hugh Cisco

Comment Type T Comment Status A
This paragraph should point to the Clause 45 ability & control bits

SuggestedRemedy
Replace the first sentence

If a Clause 45 MDIO is implemented, then this function maps to the PMA loopback function as specified in TBD.

with

If a Clause 45 MDIO is implemented, then the ability to perform this function is indicated in register 1.8.0 (45.2.1.12a.1).

Response Response Status C
ACCEPT.

Response #136

Cl 83 SC 83.5.8 P 192 L 31 # 137
Barrass, Hugh Cisco

Comment Type T Comment Status A
The reference to Clause 45 should be fixed - it should also match the one in the previous subclause.

SuggestedRemedy
Change the first sentence in the paragraph from

If a Clause 45 MDIO is implemented, then this function maps to the PMA line loopback function as specified in 45.2.1.1.4.

to

If a Clause 45 MDIO is implemented, then the ability to perform this function is indicated in register 1.13.15 (45.2.1.12a.1).

Response Response Status C
ACCEPT.

Response #138

Cl 83 SC 83.5.8 P 192 L 33 # 138
Barrass, Hugh Cisco

Comment Type T Comment Status A
Control register bit reference needs fixing

SuggestedRemedy
After "PMA/PMD Control register 1"

Add "(register 1.0.1, see 45.2.1.1.4a)"

Response Response Status C
ACCEPT.

Response #139

Cl 83 SC 83.5.9 P 192 L 10 # 139
Barrass, Hugh Cisco

Comment Type T Comment Status A
The reference to Clause 45 should be fixed - it should also match the one in the previous subclause.

SuggestedRemedy
Change the first sentence in the paragraph from

If a Clause 45 MDIO is implemented, then this function maps to the PMA line loopback function as specified in 45.2.1.1.4.

to

If a Clause 45 MDIO is implemented, then the ability to perform this function is indicated in register 1.13.15 (45.2.1.12a.1).

Response Response Status C
ACCEPT.

Response #140

Cl 83 SC 83.5.9 P 192 L 33 # 140
Barrass, Hugh Cisco

Comment Type T Comment Status A
The reference to Clause 45 should be fixed - it should also match the one in the previous subclause.

SuggestedRemedy
Change the first sentence in the paragraph from

If a Clause 45 MDIO is implemented, then this function maps to the PMA line loopback function as specified in 45.2.1.1.4.

to

If a Clause 45 MDIO is implemented, then the ability to perform this function is indicated in register 1.13.15 (45.2.1.12a.1).

Response Response Status C
ACCEPT.

Response #141

Cl 83 SC 83.5.9 P 192 L 10 # 141
Barrass, Hugh Cisco

Comment Type T Comment Status A
The reference to Clause 45 should be fixed - it should also match the one in the previous subclause.

SuggestedRemedy
Change the first sentence in the paragraph from

If a Clause 45 MDIO is implemented, then this function maps to the PMA line loopback function as specified in 45.2.1.1.4.

to

If a Clause 45 MDIO is implemented, then the ability to perform this function is indicated in register 1.13.15 (45.2.1.12a.1).

Response Response Status C
ACCEPT.

Response #142

Cl 83 SC 83.5.9 P 192 L 33 # 142
Barrass, Hugh Cisco

Comment Type T Comment Status A
The reference to Clause 45 should be fixed - it should also match the one in the previous subclause.

SuggestedRemedy
Change the first sentence in the paragraph from

If a Clause 45 MDIO is implemented, then this function maps to the PMA line loopback function as specified in 45.2.1.1.4.

to

If a Clause 45 MDIO is implemented, then the ability to perform this function is indicated in register 1.13.15 (45.2.1.12a.1).

Response Response Status C
ACCEPT.

Response #143

Cl 83 SC 83.5.9 P 192 L 10 # 143
Barrass, Hugh Cisco

Comment Type T Comment Status A
The reference to Clause 45 should be fixed - it should also match the one in the previous subclause.

SuggestedRemedy
Change the first sentence in the paragraph from

If a Clause 45 MDIO is implemented, then this function maps to the PMA line loopback function as specified in 45.2.1.1.4.

to

If a Clause 45 MDIO is implemented, then the ability to perform this function is indicated in register 1.13.15 (45.2.1.12a.1).

Response Response Status C
ACCEPT.
Comment Type: T  Comment Status: A

Much more description is needed to map the functions to Clause 45.

SuggestedRemedy:
Replace "If a Clause 45 MDIO is supported, then these functions map to the PMA test pattern functions as specified in TBD."

With

If a Clause 45 MDIO is implemented, then the ability to perform this function is indicated in PRBS pattern testing control and status (register 1.19.15, see 45.2.1.1.12b). Support for PRBS31 is indicated by bit 1.19.14, support for PRBS9 is indicated by bit 1.19.13.

Support for transmit direction generation is indicated by 1.19.11 and checking by 1.19.10; support for receive direction generation is indicated by 1.19.9 and checking by 1.19.8.

Response: Response Status: C
ACCEPt.

Comment Type: T  Comment Status: A

Ditch the TBD!

SuggestedRemedy:
Replace "(see TBD) is enabled"

With "is enabled by register 1.19.1 (see 45.2.1.1.12b)"

Response: Response Status: C
ACCEPt.

Comment Type: T  Comment Status: A

Ditch the TBD!

SuggestedRemedy:
Replace TBD with "registers 1.20 through 1.29 (see 45.2.1.1.12c)"

Response: Response Status: C
ACCEPt.

Comment Type: T  Comment Status: A

Ditch the TBD!

SuggestedRemedy:
Replace TBD with "registers 1.20 through 1.29 (see 45.2.1.1.12c)"

Response: Response Status: C
ACCEPt.
Comment Type: T Comment Status: A
Need a reference for Clause 45 register.
SuggestedRemedy
After "is enabled" add "by register 1.19.0 (see 45.2.1.1.12b)"
Response: Response Status C
ACCEPT.

Comment Type: T Comment Status: A
Ditch the TBD!
SuggestedRemedy
Replace TBD with "registers 1.30 through 1.39 (see 45.2.1.1.12d)"
Response: Response Status C
ACCEPT.

Comment Type: T Comment Status: A
Editor's note suggests a choice between PRBS7 and PRBS9.
Choose PRBS9
SuggestedRemedy
Delete the editor's note.
Replace the TBD's on line 23 and 28 with: "PRBS9" (see 48.6.1) and "PRBS9"
Replace the TBD on line 25 and 31 with "PRBS9"
Replace both the TBDs on line 34 and 42 with "PRBS9"
Replace the second TBD on line 36 and 44 with "PRBS9"
Replace the TBD on line 34, 39, 45 and 47 with "PRBS9"
Response: Response Status C
ACCEPT.

See Comment 101.
IEEE P802.3ba D1.1 40Gb/s and 100Gb/s Ethernet comments

Draft 1.1 Comments

Comment ID # 151
Barrass, Hugh Cisco

Comment Type: T
Comment Status: A
Ditch the TBD!

SuggestedRemedy
Replace "TBD count" with "registers 1.20 through 1.29 (see 45.2.1.1.12c)"

Response
Response Status: C
ACCEPT.

Comment ID # 152
Barrass, Hugh Cisco

Comment Type: T
Comment Status: A
Ditch the TBD!

SuggestedRemedy
Replace "TBD count" with "registers 1.30 through 1.39 (see 45.2.1.1.12d)"

Response
Response Status: C
ACCEPT.

Comment ID # 153
Barrass, Hugh Cisco

Comment Type: T
Comment Status: A
Ditch the TBD!

SuggestedRemedy
Replace "as described in 45.TBD" with "at identical locations in MMD 8, 9 and 10."

Response
Response Status: C
ACCEPT.

Comment ID # 154
Barrass, Hugh Cisco

Comment Type: T
Comment Status: A
Table 83-1.

SuggestedRemedy
Register names & locations to be filled in.

Response
Response Status: C
ACCEPT.

Comment ID # 155
Barrass, Hugh Cisco

Comment Type: T
Comment Status: A
Table 83-1.

SuggestedRemedy
Register names & locations to be filled in.

Response
Response Status: C
ACCEPT.

Comment ID # 156
Chung, Hwan Seok ETRI

Comment Type: E
Comment Status: A
At 86.10.2.1 optical fiber cable, line 46, correct typo. 'fulfil' to 'fulfill'.

SuggestedRemedy

Response
Response Status: C
ACCEPT IN PRINCIPLE.

Change to 'satisfy'.
For the entire document, the unit description for baud rate is GBd, not Gbd. Thus, 10.3125 Gbd should be changed to 10.3125 GBd. Also, in page 105, line 32, 'Gbd' should be 'GBd'.

SuggestedRemedy

Response

Response Status  C

ACCEPT.

also see comment 161

There are two types of description for 'signalling' in D1.1 such as 'singling' or 'signalling.' Both description are correct, but 'singaling' is mostly used across the entire document. So, to maintain consistency, it will be better to change 'signalling' to 'signaling'. These change also should be done in the following line.

page 255, line 39
page 278, line 6
page 279, line 6
page 352, line 17 & line 24
page 351, line 46
page 352, line 35, ...

SuggestedRemedy

Response

Response Status  C

ACCEPT.

Note that this will also impact clause 86 and 83A. We will go with Signaling.
Comment Type: E  Comment Status: A  
Here you used Gtransfers/s, but in 74.5.2.1.2 you used GBd, should be consistent.

SuggestedRemedy
Change to GBd.

Response  
Response Status: C  
ACCEPT.  
also see comment 349

Comment Type: E  Comment Status: A  
Add a period at the end.

SuggestedRemedy
Add a period at the end.

Response  
Response Status: C  
ACCEPT.

Comment Type: E  Comment Status: A  
This is the first time that PCSL is introduce, add the non abreviation here, PCS Lane. Then remove PCS Lane from the followin page (line 42).

SuggestedRemedy
as above.

Response  
Response Status: C  
ACCEPT.

Comment Type: T  Comment Status: A  
Remove "[Editor's note (to be removed prior to publication) - The adopted delay number of 4800 BT (see Comment #300) has been rounded to the nearest pause quanta]"

SuggestedRemedy
As above.

Response  
Response Status: C  
ACCEPT.

Comment Type: T  Comment Status: A  
Add in the PMA round trip delay constraints, and make it consistent with the summary of constraints in clause 80. Also add in an appropirate PICS for this.

SuggestedRemedy
as above.

Response  
Response Status: C  
ACCEPT IN PRINCIPLE.

Asked to include a missing requirement - may be better to put near the skew requirements rather than in the indicated location. Editorial license to choose appropriate location and compose text.
Comment Type: T  Comment Status: A  Delay

Add in the round trip delay for the PMA:
First lets look at the dynamic skew since some PMAs have to account for that:

SP1, SP5, SP1 and back to SP5 again is what we need to worry about, plus we need to multiply these numbers by 2 since people will start fifos at the half full mark...

So: (3.6ns + .2ns )*2 = 15.2ns or 1474 bits due to dynamic skew buffers.

Now in the worst case you can have multiple PMAs, but they still have to meet the above skew points so I think we don't have to add any more for the skew for multiple PMAs.

Now there is some inherent delay in the muxing stages etc, and we put down for max skew 13ns per pma stage. So delay must be at least that much. Lets add another 66b word to that, so that is 13 + 6.4 = 19.4ns, now multiply x4 = 77.6ns or 7540 bits.

So a total of 1474 + 7540 = 9014 bits, or rounded up to the nearest 512 chunk is 18*512 = 9216 BT.

SuggestedRemedy
Change the TBDs to 9216 BT, or 18 pause quanta. Make this applicable for 100GBASE-R and 40GBASE-R PMAs (right now it only has an entry for 40GBASE-R PMAs)

Response  Response Status: C
ACCEPT IN PRINCIPLE.

Adopt 9216 BT for 100G. Scale appropriately for 40G.
Cl 80 SC 80.2.2 P 116 L 18 # 173
Gustlin, Mark Cisco
Comment Type T Comment Status A
In table 80-1, the clause 74 heading is 10GBASE-R FEC, but now we differentiate FEC based on 40GBASE-R and 100GBASE-R, so we should add columns for 40GBASE-R FEC and 100GBASE-R FEC, then mark the columns appropriately.

Suggested Remedy
As above.

Response Response Status C
ACCEPT IN PRINCIPLE.
Change the column heading from 10GBASE-R FEC to BASE-R FEC Clause 74 Title

Cl 80 SC 80.2.2 P 116 L 12 # 174
Gustlin, Mark Cisco
Comment Type T Comment Status A
In table 80-1 we should add in a column on the PPI interface? And mark it appropriately?

Suggested Remedy
As above.

Response Response Status C
ACCEPT IN PRINCIPLE.
Add a column and mark PPI as optional for SR4 and SR10.

Cl 81 SC 81.1 P 123 L 49 # 176
Gustlin, Mark Cisco
Comment Type T Comment Status R
Remove the editor's note and live with the MII name.

Suggested Remedy

Response Response Status C
REJECT.

This comment was WITHDRAWN by the commenter. Overtaken by comment #172.
Comment Type: T  Comment Status: R

Tabel 80-4 does not have an entry for 100GBASE-R dynamic skew in Ul's at the PCS receive, in clause 82 we do have it.

Suggested Remedy
Add in 21 UI for a pcs lane dynamic skew at the 100GBASE-R rx pcs.

Response: Response Status: C
REJECT.

This comment was WITHDRAWN by the commenter.

Comment Type: T  Comment Status: A

Change: "An implementation may use one or more PMA sublayers to adapt from the PCS formatted lanes to the supported PMD."

To: "An implementation may use one or more PMA sublayers to adapt the number and rate of the PCS lanes to the number and rate of PMD lanes."

Suggested Remedy
As above.

Response: Response Status: C
ACCEPT.

Comment Type: T  Comment Status: A

In figure 83-5, the indications and requests should have an x to indicate that they apply to multiple bits.

Suggested Remedy
Add the italic x to each indication and request (except for the status).

Response: Response Status: C
ACCEPT.

Comment Type: T  Comment Status: R

Make system side loopbacks optional for any PMA sublayer, not just the uppermost.

Many devices will implement them, so it would be good to have the management information to be consistent.

Suggested Remedy
As above.

Response: Response Status: C
REJECT.

This comment was WITHDRAWN by the commenter.
The "Fiber cable attenuation (max)" description is incomplete. The wavelength must also be specified as the attenuation value changes with wavelength. The nominal operating wavelength of clause 86 is 850 nm.

Suggested Remedy
Change the description to "Fiber cable attenuation at 850 nm (max)"

Response
ACCEPT IN PRINCIPLE.
See response to 582.

The chromatic dispersion specifications were modified by comment to draft 1.0, but contain an error. The upper wavelength limit for the 0.105 value should be 1310 nm not 1305 nm to be consistent with the fiber specification standards in TIA and IEC. The existing value leaves a 5 nm range unspecified.

Suggested Remedy
Change 1305 to 1310.

Response
ACCEPT.

Optical lane assignments for 40GBASE-SR4 must be defined to provide an interoperable interface that provides proper connectivity over standard structured cabling infrastructures. The editor's note invites contributions proposing content for this subclause.

Suggested Remedy
See contribution kolesar_01_0109 for slides containing rationale and specific content in the form of text and figure. The slides within this contribution intended for subclause 86.10.2.3 are so entitled atop each slide. The proposed content is intended to be a replacement for the present text. Note: This contribution also contains proposed content for related subclauses 86.5.1 and 86.5.2.

Response
ACCEPT IN PRINCIPLE.
Populate clause 86.10.2.3 with content of slide 23 and 24 of kolesar_01_0109.pdf
Grant editorial licence in modifying this text to fit with the agreements for clauses 86.5.1 and 86.5.2.

Optical lane assignments for 40GBASE-SR4 must be defined to provide an interoperable interface that provides proper connectivity over standard structured cabling infrastructures. The editor's note invites contributions proposing content for this subclause.

Suggested Remedy
See contribution kolesar_01_0109 for slides containing rationale and specific content in the form of text and figure. The slides within this contribution intended for subclause 86.10.2.3 are so entitled atop each slide. The proposed content is intended to be a replacement for the present text. Note: This contribution also contains proposed content for related subclauses 86.5.1 and 86.5.2.

Response
ACCEPT IN PRINCIPLE.
Populate clause 86.10.2.3 with content of slide 23 and 24 of kolesar_01_0109.pdf
Grant editorial licence in modifying this text to fit with the agreements for clauses 86.5.1 and 86.5.2.

Optical lane assignments for 40GBASE-SR4 must be defined to provide an interoperable interface that provides proper connectivity over standard structured cabling infrastructures. The editor's note invites contributions proposing content for this subclause.

Suggested Remedy
See contribution kolesar_01_0109 for slides containing rationale and specific content in the form of text and figure. The slides within this contribution intended for subclause 86.10.2.3 are so entitled atop each slide. The proposed content is intended to be a replacement for the present text. Note: This contribution also contains proposed content for related subclauses 86.5.1 and 86.5.2.

Response
ACCEPT IN PRINCIPLE.
Populate clause 86.10.2.3 with content of slide 23 and 24 of kolesar_01_0109.pdf
Grant editorial licence in modifying this text to fit with the agreements for clauses 86.5.1 and 86.5.2.
Optical lane assignments for 1000GBASE-SR10 must be defined to provide an interoperable interface that provides proper connectivity over standard structured cabling infrastructures. The editor's note invites contributions proposing content for this subclause.

**Suggested Remedy**

See contribution kolesar_01_0109 for slides containing rationale and specific content in the form of text and figures. The slides within this contribution intended for subclause 86.5.2 are so entitled atop each slide. Note: This contribution also contains proposed content for related subclauses 86.5.1 and 86.10.2.3.

**Response**

Accept in principle.

Populate clause 86.5.2 with content of slide 19 through 22 of kolesar_01_0109.pdf

Modify the content to indicate that there are three options, the arrangement shown in Figure 86-4c is "Recommended" and the two arrangements shown in Figures 86-a and 86-b are "Alternatives"

Grant editorial licence in modifying this text.

**Comment Type:** TR  
**Comment Status:** A  
**Lanes**

Inserted text says "and the PCS control 2 register 45.2.3.6..." - missing "specified in" and double "."  
Also, some external links in this paragraph are not shown blue and some internal paragraphs are not cross-referenced.

**Suggested Remedy**

Change to "and the PCS control 2 register specified in 45.2.3.6."

Clause 22, clause 35, 22.2.4.1, Clause 28, Clause 37 should be dark blue.

45.2.3.6.1, 45.2.1.6.1, 45.2.1.1, 45.2.3.6, Clause 73 should be cross-references.

**Response**

Accept.

**Comment Type:** E  
**Comment Status:** A  
**Comment ID # 199**

There is just a heading for 30.2.5 after 30.6.1.1.5

**Suggested Remedy**

Remove heading or pace in correct order if there are further changes to be inserted in this clause.

**Response**

Accept in principle.

See #341

**Comment Type:** E  
**Comment Status:** A  
**Comment ID # 191**

The actions in the Editor's note have been performed.

**Suggested Remedy**

Remove note.

**Response**

Accept.
Anslow, Peter
Nortel Networks

**Comment ID # 192**

**Cl 45 SC 45.2.1**

**P 37 L 3**

Comment Type **E**  
Comment Status **A**  

Spaces missing, internal reference  

SuggestedRemedy  

- insert space in 40Gb/s (line 3) and MMD1 (line 9)  
- Table 45-2 should be cross reference (line 10)

Response  
Response Status **C**  
ACCEPT.

**Comment ID # 193**

Anslow, Peter
Nortel Networks

**Cl 45 SC 45.4**

**P 41 L 35**

Comment Type **T**  
Comment Status **A**  

The terms "PMA line-side loopback" and "PMA system loopback" do not clearly convey what function they perform. Also, clause 83 uses the term "line loopback" A seperate comment is submitted against clause 83 - these comments must be resolved together.

SuggestedRemedy  

- Change all instances of "line-side loopback" to "remote loopback" and all instances of "system loopback" to "local loopback"

Response  
Response Status **C**  
ACCEPT.

Also see comment #201.

**Comment ID # 194**

Anslow, Peter
Nortel Networks

**Cl 45 SC 45.2.1.1.4a**

**P 42 L 11**

Comment Type **E**  
Comment Status **A**  

This says "the system loopback ability bit is specified in"  
This should be "line loopback" if comment to re-name is rejected and "remote loopback" if comment to re-name is accepted.

SuggestedRemedy  

- change to "the remote loopback ability bit is specified in" or "the line loopback ability bit is specified in"

Response  
Response Status **C**  
ACCEPT IN PRINCIPLE.

Change to "remote" because #193 & #201 are accepted.

**Comment ID # 195**

Anslow, Peter
Nortel Networks

**Cl 45 SC 45.2.1.1.4a**

**P 42 L 10**

Comment Type **E**  
Comment Status **A**  

83.xxxx should be a cross-reference to 83.5.8

SuggestedRemedy  

- change 83.xxxx to a cross-reference to 83.5.8

Response  
Response Status **C**  
ACCEPT.

**Comment ID # 196**

Anslow, Peter
Nortel Networks

**Cl 45 SC 45.2.1.1.4a**

**P 42 L 30**

Comment Type **E**  
Comment Status **A**  

83.xxxx should be a cross-reference to 83.5.7

SuggestedRemedy  

- change 83.xxxx to a cross-reference to 83.5.7

Response  
Response Status **C**  
ACCEPT.

**Comment ID # 197**

Anslow, Peter
Nortel Networks

**Cl 81 SC 81.3.4**

**P 138 L 20**

Comment Type **E**  
Comment Status **A**  

"Clause 46" is an external link

SuggestedRemedy  

- Make it dark blue

Response  
Response Status **C**  
ACCEPT.

**Comment ID # 198**

Anslow, Peter
Nortel Networks

**Cl 82 SC 82.1.2**

**P 147 L 27**

Comment Type **E**  
Comment Status **A**  

Two instances of "Clause 49" which is an external link

SuggestedRemedy  

- show as dark blue

Response  
Response Status **C**  
ACCEPT.
The term used for the PCS generated test pattern is "pseudo-random". This name, however, is easily confused with two of the PMA generated patterns PRBS31 and (likely) PRBS9. It would be better to change the name in line with that used in Tables 87-10 and 88-14 "Scrambled idle"

SuggestedRemedy
Change to:
"There is a single type of required PCS transmit test pattern: scrambled idle. The scrambled idle test-pattern mode is ..."
and "When scrambled idle pattern is selected, the test pattern..."

Also in 82.2.17 change "pseudo-random" to "scrambled idle" in 6 places

Response
ACCEPT IN PRINCIPLE.

See the response in comment #318.

The text says: "When line loopback is enabled, each bit received over the PMD service interface via the x=0 to q-1. Note that "PMA server" can represent the FEC, PMD, or another PMA sublayer. PMAserver_UNITDATA.indication(x, bit) primitive is sent back toward the PMA via the PMAserver_UNITDATA.request(x, bit) primitive." which doesn't make sense.

SuggestedRemedy
Change to "When line loopback is enabled, each bit received over the PMD service interface via the PMAserver_UNITDATA.indication(x, bit) primitive is sent back toward the PMA via the PMAserver_UNITDATA.request(x, bit) primitive."

Response
ACCEPT.

See response to comment #193.
Cl  85  SC  85.7.1  P  220  L  25  #   203
Anslow, Peter  Nortel Networks

Comment Type  T  Comment Status  A
Comment
In figure 85-2 on the left and right edges are shown "tx_bit<0:3> or x_bit<0:9>". However the latest service primitives all have the same parameter "tx_bit".

Suggested Remedy
change figure 85-2 to use the same labelling as Figure 86-2 (and 87-2 and 88-2) "PMD_UNITDATA.request0 to PMD_UNITDATA.requestn"

Response  Response Status  C
ACCEPT.

Cl  86  SC  86.6.6  P  261  L  32  #   204
Anslow, Peter  Nortel Networks

Comment Type  T  Comment Status  A
Comment
In Table 86-13 notes b and d say:
b [Editor's note (to be removed prior to publication) - For further study]
d [Editor's note (to be removed prior to publication) - Connector loss under study]
These values seem to be as stable as any others in this clause, so these notes are no longer needed.

Suggested Remedy
Remove editor's notes b and d

Response  Response Status  C
ACCEPT.

Cl  86  SC  86.7.2  P  263  L  36  #   205
Anslow, Peter  Nortel Networks

Comment Type  T  Comment Status  A
Comment
Table 86-15 pattern 4
Since the DDPWS measurement is specified to use PRBS9, make this the short TBD

Suggested Remedy
Change "Short TBD" to "PRBS9"

Response  Response Status  C
ACCEPT IN PRINCIPLE.

See response to comment 505.
See also comments 562, 473, 563, 460, 655, 332.
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
<th>Response</th>
<th>Response Status</th>
<th>Comment ID</th>
<th>SC</th>
<th>P</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>#208</td>
<td>86</td>
<td>269</td>
<td>48</td>
<td>T</td>
<td>A</td>
<td>Remove TBD</td>
<td></td>
<td>C</td>
<td>#211</td>
<td>86</td>
<td>262</td>
<td>42</td>
</tr>
<tr>
<td>Cl 86</td>
<td>SC 86.7.5.9</td>
<td></td>
<td></td>
<td>Patterns</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Cl 86</td>
<td>SC 86.7.2</td>
<td>P 262</td>
<td>L 42</td>
</tr>
<tr>
<td>Anslow, Peter</td>
<td>Nortel Networks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Anslow, Peter</td>
<td>Nortel Networks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comment Type</td>
<td>T</td>
<td>Comment Status</td>
<td>A</td>
<td>Suggested Remedy</td>
<td>Change &quot;TBD, or a valid 40GBASE-R4&quot; to &quot;Test patterns 3 or 5, or a valid 40GBASE-R4&quot;</td>
<td>Accept in principle.</td>
<td>See response to comment 580</td>
<td></td>
<td></td>
<td>Cl 86</td>
<td>SC 86.7.4.3</td>
<td>P 266</td>
</tr>
<tr>
<td>Anslow, Peter</td>
<td>Nortel Networks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Cl 86</td>
<td>SC 86.7.4.2</td>
<td>P 265</td>
<td>L 45</td>
</tr>
<tr>
<td>Comment Type</td>
<td>E</td>
<td>Comment Status</td>
<td>A</td>
<td>Suggested Remedy</td>
<td>typo &quot;wve&quot; to &quot;wave&quot;</td>
<td>Accept.</td>
<td></td>
<td>Cl 86</td>
<td>SC 86.7.1</td>
<td>P 262</td>
<td>L 10</td>
<td></td>
</tr>
<tr>
<td>Anslow, Peter</td>
<td>Nortel Networks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Cl 86</td>
<td>SC 86.7.4.2</td>
<td>P 266</td>
<td>L 3</td>
</tr>
<tr>
<td>Comment Type</td>
<td>T</td>
<td>Comment Status</td>
<td>A</td>
<td>Suggested Remedy</td>
<td>In figure 86-3 SP5 is shown as the same as TP4. However, in figures 80-2 and 80-3 SP5 is shown as the input to the PMA and therefore includes all skew due to the interconnect between the PMD and the PMA.</td>
<td>Accept in principle.</td>
<td>Overtaken by events. See response to comment 280.</td>
<td></td>
<td></td>
<td>Cl 86</td>
<td>SC 86.7.2</td>
<td>P 262</td>
</tr>
<tr>
<td>Anslow, Peter</td>
<td>Nortel Networks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Anslow, Peter</td>
<td>Nortel Networks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comment Type</td>
<td>E</td>
<td>Comment Status</td>
<td>A</td>
<td>Suggested Remedy</td>
<td>Equation 86-6 uses a mixture of &quot;x&quot; and &quot;.&quot; for multiply</td>
<td>To be consistent with other equations in clause 86 change to &quot;x&quot;</td>
<td>Accept.</td>
<td></td>
<td>Cl 86</td>
<td>SC 86.7.4.2</td>
<td>P 266</td>
<td>L 3</td>
</tr>
<tr>
<td>Anslow, Peter</td>
<td>Nortel Networks</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Anslow, Peter</td>
<td>Nortel Networks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Comment Type</td>
<td>T</td>
<td>Comment Status</td>
<td>A</td>
<td>Suggested Remedy</td>
<td>Figure 86-4 uses the same symbol for an electrical connector as the previous figures used for an optical connector.</td>
<td>Change the symbol for the electrical connectors to be the same as was used in figure 86-3 for an electrical connector.</td>
<td>Accept.</td>
<td></td>
<td>Cl 86</td>
<td>SC 86.7.2</td>
<td>P 262</td>
<td>L 42</td>
</tr>
</tbody>
</table>

**Comment ID:** #212

**Comment Type:** E

**Comment Status:** A

**Suggested Remedy:**

- Change to: "NOTE-Test patterns 3 and 4 are designed to emulate system operation; however, they do not form valid 40GBASE-R4 or 100GBASE-R10 signals.”

**Response:**

Accept in principle. Delete entire note.

**Response Status:** C

**Comment ID:** #213

**Comment Type:** T

**Comment Status:** A

**Suggested Remedy:**

- Change the symbol for the electrical connectors to be the same as was used in figure 86-3 for an electrical connector.

**Response:**

Accept.

**Response Status:** C

---

**TYPE:** TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general

**COMMENT STATUS:** D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn

**SORT ORDER:** Comment ID
Comment Type: T  Comment Status: R
The symbol used in Figure 86-3 for the optical connector to the modules is not consistent with that used in Figure 86-2 (or 87-2 or 88-2)

Suggested Remedy:
Change the optical connector symbol to the modules to be consistent with that used in Figure 86-2

Response: Response Status: C
REJECT.
This comment was WITHDRAWN by the commenter.

Comment Type: E  Comment Status: A
In equation 86-9 the "y" at the beginning is clipped off

Suggested Remedy:
Highlight equation, Special, Equations, click on the equations button and select "Shrink-Wrap Equation"

Response: Response Status: C
ACCEPT.

Comment Type: E  Comment Status: A
There are two tables numbered 86-17

Suggested Remedy:
Change Autonumber format of second instance from "H:Table <n>=<><><><><><<><><><><><><m>" to "H:Table <n>=><><><><><><><><><><><><><><><><><><><m>"

Response: Response Status: C
ACCEPT IN PRINCIPLE.
Table deleted per another comment.

Comment Type: E  Comment Status: A
The max round trip delay including 2m of fiber for 40GBASE-LR4 is TBD. The values for 40GBASE-SR4 have been set at 1024 bit-times, or 2 pause_quanta and the delay for 40GBASE-LR4 should be similar.

Suggested Remedy:
Change "of not more than TBD (1536) bit-times, or TBD (3) pause_quanta" to "of not more than 1024 bit-times, or 2 pause_quanta"
Remove editor's note

Response: Response Status: C
ACCEPT.

Comment Type: E  Comment Status: A
Stressed eye jitter, each lane is TBD.
Since each lane of 40GBASE-LR4 is similar to 10GBASE-LR, use the value from Table 52-13 of 0.3 UI pk-pk

Suggested Remedy:
set the Stressed eye jitter, each lane to 0.3 UI pk-pk

Response: Response Status: C
ACCEPT.
### Draft 1.1 Comments

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC 87.7.3</th>
<th>P 292</th>
<th>L 18</th>
<th>#</th>
<th>Anslow, Peter</th>
<th>Nortel Networks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Comment Type</strong></td>
<td>T</td>
<td><strong>Comment Status</strong></td>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In Table 87-9 footnote b contains an editor's note. This note is no longer needed as the value of 2.3 dB for penalties has been stable for some time.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Suggested Remedy</strong></td>
<td>Remove editor's note from footnote b</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response</strong></td>
<td></td>
<td></td>
<td>ACCEPT.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC 87.8.1</th>
<th>P 292</th>
<th>L 41</th>
<th>#</th>
<th>Anslow, Peter</th>
<th>Nortel Networks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Comment Type</strong></td>
<td>T</td>
<td><strong>Comment Status</strong></td>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pattern 4 is TBD. Since PRBS9 is required for DDPWS in clause 86, change TBD to PRBS9</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Suggested Remedy</strong></td>
<td>Change pattern 4 from &quot;TBD&quot; to PRBS9&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response</strong></td>
<td></td>
<td></td>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>See response to comment 438</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC 87.8.1</th>
<th>P 292</th>
<th>L 47</th>
<th>#</th>
<th>Anslow, Peter</th>
<th>Nortel Networks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Comment Type</strong></td>
<td>T</td>
<td><strong>Comment Status</strong></td>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The rise/fall times and RIN requirements for the reference transmitter are TBD. Since each lane of 40GBase-LR4 is similar to 10GBase-LR, use the values from 52.9.10.1 of 30 ps and -136 dB/Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Suggested Remedy</strong></td>
<td>change &quot;less than TBD ps at 20% to 80%&quot; to &quot;less than 25 ps at 20% to 80%&quot; change &quot;less than -TBD dB/Hz&quot; to &quot;less than -136 dB/Hz&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response</strong></td>
<td></td>
<td></td>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delete entire note.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**Comment ID # 223**

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC 87.8.1</th>
<th>P 293</th>
<th>L 5</th>
<th>#</th>
<th>Anslow, Peter</th>
<th>Nortel Networks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Comment Type</strong></td>
<td>T</td>
<td><strong>Comment Status</strong></td>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In Table 87-11 most of the test patterns are undefined.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Suggested Remedy</strong></td>
<td>Leave &quot;Optical modulation amplitude (OMA)&quot; as &quot;Square&quot; Change parameter name &quot;RINxOMA&quot; to &quot;RIN20OMA&quot; and leave as &quot;Square&quot; Set &quot;Calibration of OMA for receiver tests&quot; to &quot;Square&quot; Set the pattern for all other rows to: &quot;3, 5 or valid 40GBASE-LR signal&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response</strong></td>
<td></td>
<td></td>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>See response to comment 438</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC 87.8.6.1</th>
<th>P 294</th>
<th>L 10</th>
<th>#</th>
<th>Anslow, Peter</th>
<th>Nortel Networks</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Comment Type</strong></td>
<td>T</td>
<td><strong>Comment Status</strong></td>
<td>A</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The rise/fall times and RIN requirements for the reference transmitter are TBD. Since each lane of 40GBase-LR4 is similar to 10GBase-LR, use the values from 52.9.10.1 of 30 ps and -136 dB/Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Suggested Remedy</strong></td>
<td>change &quot;less than TBD ps at 20% to 80%&quot; to &quot;less than 25 ps at 20% to 80%&quot; change &quot;less than -TBD dB/Hz&quot; to &quot;less than -136 dB/Hz&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Response</strong></td>
<td></td>
<td></td>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>see also comment 224 477</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Comment Type: T  Comment Status: A
Remove TBD

SuggestedRemedy
change ", such as TBD signal, are likely" to ", such as a 223-1 PRBS, are likely" where 223 is 2 raised to the power 23

Response  
ACCEPT IN PRINCIPLE.
See Response to comment 240.
See also comments 468 and 207

Comment Type: T  Comment Status: A
Clause 87.8.10 consists only of an editor's note. The PMD specifications for 10GBASE-LR and -ER in clause 52 do not have separate transmitter jitter requirements and 40GBASE-LR4 is very similar to this so remove this clause

SuggestedRemedy  
Remove clause 87.8.10 entirely.

Response  
ACCEPT.
see also comments 487 226

Comment Type: T  Comment Status: A
Table 87-13 for the applied sinusoidal jitter is TBD. Since each lane of 40GBASE-LR4 is similar to 10GBASE-LR, use the values from Table 52-19

SuggestedRemedy  
Remove Table 87-13 and refer to Table 52-19 instead.

Response  
ACCEPT IN PRINCIPLE.
Populate the table as per Table 52-19
The max round trip delay including 2m of fiber for 100GBASE-LR4 and ER4 is TBD. The values for 100GBASE-SR10 have been set at 2048 bit-times, or 4 pause_quanta and the delay for 100GBASE-LR4 or ER4 should be similar.

SuggestedRemedy
Change "of not more than TBD (1536) bit-times, or TBD (3) pause_quanta" to "of not more than 2048 bit-times, or 4 pause_quanta"
Remove editor's note

SuggestedRemedy
In Table 88-7, the value 2.2 for "Transmitter and dispersion penalty, each lane (max)" has an associated editor's note. Since there have been no proposals to change this value, remove the editor's note. Also applies to Allocation for penalties in Table 88-9

SuggestedRemedy
Remove editor's note and show values of 2.2 in normal font in Tables 88-7 and 88-9

SuggestedRemedy
Beneath Tables 88-7 and 88-11 there are notes stating "a possible peak power specification is under consideration for 100GBASE-LR4 and ER4".

SuggestedRemedy
Either introduce such a specification and remove the editor's notes or just remove the editor's notes.

SuggestedRemedy
The square wave isn't really designed to emulate system operation and pattern 5 is a valid 40GBASE-R signal.

SuggestedRemedy
Change "TBD test patterns are designed" to "Test patterns 3 and 4 are designed"

SuggestedRemedy
Remove TBD. The square wave isn't really designed to emulate system operation and pattern 5 is a valid 40GBASE-R signal.

SuggestedRemedy
Change "TBD test patterns are designed" to "Test patterns 3 and 4 are designed"

SuggestedRemedy
set the Stressed eye jitter, each lane to 0.3 UI pk-pk in Tables 88-8 and 88-12

Response
Accept
In Table 88-15 most of the test patterns are undefined.

**Suggested Remedy**

- Leave "Optical modulation amplitude (OMA)" as "Square"
- Change parameter name "RINxOMA" to "RIN20OMA" and leave as "Square"
- Set "Calibration of OMA for receiver tests" to "Square"
- Set the pattern for all other rows to: "3, 5 or valid 100GBASE-R signal"

**Response**

**Response Status**: C

ACCEPT IN PRINCIPLE.

See Response to comment 223

See also comment 475

---

The rise/fall times and RIN requirements for the reference transmitter are TBD. Since each lane of 100GBASE-LR4/ER4 is similar to 10GBASE-LR except for the higher lane rate, use the values from 52.9.10.1 of 30 ps and -136 dB/Hz scaled by the relative lane rates.

**Suggested Remedy**

- change "less than TBD ps at 20% to 80%" to "less than 12 ps at 20% to 80%"
- change "less than -TBD dB/Hz" to "less than -140 dB/Hz"

**Response**

**Response Status**: C

ACCEPT IN PRINCIPLE.

See also comments 223 and 475

---

The filter tolerances are TBD.

The tolerances specified for STM-64 in G.691 are:

+/- 0.85 dB for f/r from 0.001 to 1
and +/− 0.85 dB to +/- 4.0 dB for f/r from 1 to 2

**Suggested Remedy**

Change "filter tolerances TBD" to "filter tolerances as specified for STM-64 in ITU-T G.691"

**Response**

**Response Status**: C

ACCEPT.

---

Table 88-17 for the applied sinusoidal jitter is TBD. Since each lane of 100GBASE-LR4/ER4 is similar to 10GBASE-LR except for the higher lane rate, use the values from Table 52-19 with the frequencies scaled by the relative lane rates.

**Suggested Remedy**

Set the Jitter values according to the values in Table 52-19 with the three rows as:

- f < 100 kHz, Not specified
- 100 kHz < f <= 10 MHz, 2×10^5/f + S - 0.05
- 10 MHz < f < 10 LB, 0.05 <= S <= 0.15

with a note for S "S is the magnitude of sine jitter actually used in the calibration of the stressed eye per the methods of 52.9.9.3"

**Response**

**Response Status**: C

ACCEPT IN PRINCIPLE.

Give editorial licence
Cl. 88 SC. 88.9.11 P. 325 L. 30 # 243
Anslow, Peter Nortel Networks

Comment Type: T
Comment Status: A

Remove TBD

Suggested Remedy:
change "TBD, or valid" to "Test patterns 3 or 5, or valid"

Response: Response Status: C

ACCEPT IN PRINCIPLE.

change "TBD, or valid" to "Test patterns 3 or 5, or valid"

Cl. 83A SC. 83A.1.1 P. 350 L. 27 # 244
Latchman, Ryan Gennum Corp

Comment Type: E
Comment Status: A

Remove Editors Note:

[Editor's note: (to be removed prior to publication) - condition for total jitter error rate at 1E-15 is proposed]

Suggested Remedy:
Remove

Response: Response Status: C

ACCEPT.

Cl. 83A SC. 83A.2 P. 350 L. 49 # 245
Latchman, Ryan Gennum Corp

Comment Type: E
Comment Status: A

Remove Editor's Note:

[Editor's note: (to be removed prior to publication) - include definition of XLAUI, CAUI link block diagram, test points and channel boundaries in this section]

Suggested Remedy:
Remove

Response: Response Status: C

ACCEPT.

Cl. 83A SC. 83A.2.1 P. 351 L. 5 # 246
Latchman, Ryan Gennum Corp

Comment Type: E
Comment Status: A

Remove Editor's Note:

[Editor's note: (to be removed prior to publication) - Insert or change, to include definition of transmit test points]

Suggested Remedy:
Remove

Response: Response Status: C

ACCEPT.

Cl. 83A SC. 83A.2.2 P. 351 L. 15 # 247
Latchman, Ryan Gennum Corp

Comment Type: E
Comment Status: A

Remove: [Editor's note: (to be removed prior to publication) - Insert or change, to include definition of receive test points]

Suggested Remedy:
Remove

Response: Response Status: C

ACCEPT.

Cl. 83A SC. 83A.3.3 P. 352 L. 11 # 248
Latchman, Ryan Gennum Corp

Comment Type: E
Comment Status: A

Delete Editor Comments:
[Editor's note: (to be removed prior to publication) - transmitter eyemask as defined in figure 83A-5 is not considered a sufficient description to guarantee performance; additional test methods are required]
Editor's note: (to be removed prior to publication) - proposals for jitter methodology to be submitted against D1.1 for completion of TBDs]

Suggested Remedy:
Remove

Response: Response Status: C

ACCEPT.
**Comment ID:** 250

**Comment Type:** T  **Comment Status:** A  **Response Status:** C

**Comment:**

**Type:** TR/technical required  **ER/editorial required**  **GR/general required**  **T/technical**  **E/editorial**  **G/general**

**Comment Status:** D/dispatched  A/accepted  R/rejected  **RESPONSE STATUS:** O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn

**SORT ORDER:** Comment ID

---

**Comment:**

**Comment Type:** T  **Comment Status:** A  **Response Status:** C

**Comment:**

**Type:** TR/technical required  **ER/editorial required**  **GR/general required**  **T/technical**  **E/editorial**  **G/general**

**Comment Status:** D/dispatched  A/accepted  R/rejected  **RESPONSE STATUS:** O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn

**SORT ORDER:** Comment ID

---

**Comment:**

**Comment Type:** E  **Comment Status:** A  **Response Status:** C

**Comment:**

**Type:** TR/technical required  **ER/editorial required**  **GR/general required**  **T/technical**  **E/editorial**  **G/general**

**Comment Status:** D/dispatched  A/accepted  R/rejected  **RESPONSE STATUS:** O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn

**SORT ORDER:** Comment ID

---

**Comment:**

**Comment Type:** T  **Comment Status:** A  **Response Status:** C

**Comment:**

**Type:** TR/technical required  **ER/editorial required**  **GR/general required**  **T/technical**  **E/editorial**  **G/general**

**Comment Status:** D/dispatched  A/accepted  R/rejected  **RESPONSE STATUS:** O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn

**SORT ORDER:** Comment ID

---

**Comment:**

**Comment Type:** T  **Comment Status:** A  **Response Status:** C

**Comment:**

**Type:** TR/technical required  **ER/editorial required**  **GR/general required**  **T/technical**  **E/editorial**  **G/general**

**Comment Status:** D/dispatched  A/accepted  R/rejected  **RESPONSE STATUS:** O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn

**SORT ORDER:** Comment ID

---

**Comment:**

**Comment Type:** T  **Comment Status:** A  **Response Status:** C

**Comment:**

**Type:** TR/technical required  **ER/editorial required**  **GR/general required**  **T/technical**  **E/editorial**  **G/general**

**Comment Status:** D/dispatched  A/accepted  R/rejected  **RESPONSE STATUS:** O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn

**SORT ORDER:** Comment ID

---

**Comment:**

**Comment Type:** T  **Comment Status:** A  **Response Status:** C

**Comment:**

**Type:** TR/technical required  **ER/editorial required**  **GR/general required**  **T/technical**  **E/editorial**  **G/general**

**Comment Status:** D/dispatched  A/accepted  R/rejected  **RESPONSE STATUS:** O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn

**SORT ORDER:** Comment ID
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Suggested Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>253</td>
<td>T</td>
<td>A</td>
<td>Remove Editor's Note: (to be removed prior to publication) - proposals for jitter methodology to be submitted against D1.1 for completion of TBDs.</td>
<td>Remove</td>
</tr>
<tr>
<td>254</td>
<td>T</td>
<td>A</td>
<td>Minimum Differential Input Voltage Parameter is not useful in the table since it points to another area in the table (See receiver eye mask definition).</td>
<td>Remove Minimum Differential Input Voltage Parameter</td>
</tr>
<tr>
<td>255</td>
<td>T</td>
<td>A</td>
<td>Maximum non-EQ Jitter is not well defined.</td>
<td>Change Parameter to Maximum Deterministic Jitter</td>
</tr>
<tr>
<td>256</td>
<td>T</td>
<td>A</td>
<td>BER Target BER 1E-12. Section for lower BER values to be added</td>
<td>Change TBD to 1E-12. Change Parameter to Maximum Deterministic Jitter.</td>
</tr>
<tr>
<td>257</td>
<td>E</td>
<td>A</td>
<td>No input has been received from Statistical Eye Adhoc.</td>
<td>Remove</td>
</tr>
<tr>
<td>258</td>
<td>E</td>
<td>A</td>
<td>No input has been received on Rx input amplitude. This is covered by the Receiver template and therefore unnecessary</td>
<td>Remove section 83A.3.4.3</td>
</tr>
</tbody>
</table>

See resolution in comment 259

Latchman, Ryan Gennum Corp
non-EQ jitter is no longer specified. Replace with DJ / RJ terms

The XLAUI/CAUI receiver shall have a peak-to-peak total jitter amplitude tolerance of at least 0.62 UI. This total jitter is composed of two components: Deterministic Jitter and Random Jitter. Deterministic jitter tolerance shall be at least 0.42 Ulp-p. The XLAUI/CAUI receiver shall tolerate sinusoidal jitter with any frequency and amplitude defined by the mask of Figure 83A-10. This sub-component of deterministic is intended to ensure margin for low-frequency jitter, wander, noise, crosstalk and other variable system effects.

ACCEPT.
See suggested remedy.

Comment Type: Technical required
Comment Status: Accepted
Response: ACCEPT.
See suggested remedy.

This section describes informative characteristics which are used to describe an XLAUI / CAUI channel.

The informative values for insertion loss are summarized in table YYY and equation ZZZ. Other impairments such as crosstalk can have a material impact on the link performance and should be minimized

Where tables are found in latchman_xlc_01_1208.pdf

ACCEPT IN PRINCIPLE.

Supporting text for comment #60 where table is not provided and use equation as reference to informative channel loss.

The eye templates are given in Figure 83A-6 and Table 83A-1. The template measurement requirements are specified in 83A.5.1. The jitter requirements at the transmitter are for a maximum total jitter of 0.32 UI peak-to-peak and a maximum deterministic component of 0.17 UI peak-to-peak. The maximum random jitter is equal to the maximum total jitter minus the actual deterministic jitter. Jitter measurement requirements are described in 83A.5.2, and are conducted with de-emphasis off.

ACCEPT.
See suggested remedy.

Replace editorial (Editor's note: (to be removed prior to publication) - Insert or change, to include interconnect definition]) comment with loss description found in latchman_xlc_01_1208.pdf

Interconnect loss limit is described by the following equation:
(equation from latchman_xlc_01_1208.pdf)

where b1, b2, b3, b4, f1, f2, fmax are given in the following table (table from latchman_xlc_01_1208.pdf)

Insert plot from latchman_xlc_01_1208.pdf

ACCEPT IN PRINCIPLE.
See remedy comment#60
Cl  83A  SC  83A.4.1.1  P 362  L 31  # 263
Latchman, Ryan  Gennum Corp

Comment Type T  Comment Status A
No material received with respect to characteristic impedance

SuggestedRemedy
Remove section and comment

Response  Response Status C
ACCEPT IN PRINCIPLE.
Insert:
The recommended differential characteristic impedance of circuit board trace pairs is 100ohm +/- 10%

Cl  83A  SC  83A.5  P 362  L 39  # 264
Latchman, Ryan  Gennum Corp

Comment Type T  Comment Status A
Replace editor's comment with actual text

SuggestedRemedy
This section describes the measurement methodology which is to be used to verify XLAUI / CAUI compliance

Response  Response Status C
ACCEPT.

Cl  83A  SC  83A.5.2.1  P 362  L 43  # 265
Latchman, Ryan  Gennum Corp

Comment Type T  Comment Status A
Incomplete transmit jitter measurement methodology. Replace following text: The clock recovery unit (CRU) used in the transmit jitter measurement has a corner frequency of less than or equal to 4 MHz and a slope of -20 dB/decade (need figure consistent with text). When using a CRU as a clock for jitter measurements.

[Editor's note: (to be removed prior to publication) - Insert or change, to include transmit jitter]

With below

SuggestedRemedy
Include the following text:

Transmit jitter is defined with respect to a test procedure resulting in a BER bathtub curve such as that described in Annex 48B.3. For the purpose of jitter measurement, the effect of a single-pole high-pass filter with a 3 dB point at 4 MHz is applied to the jitter. The data pattern for jitter measurements shall be test patterns YYY or WWW as defined in CCCCC. Crossing times are defined with respect to the mid-point (0 V) of the AC-coupled differential signal. Equalization shall be off during jitter testing.

Response  Response Status C
ACCEPT.

83A.5.2.1 Transmit jitter
Transmit jitter is defined with respect to a test procedure resulting in a BER bathtub curve such as that described in Annex 48B.3. For the purpose of jitter measurement, the effect of a single-pole high-pass filter with a 3 dB point at 4 MHz is applied to the jitter. The data pattern for jitter measurements shall be test pattern PRBS31. Crossing times are defined with respect to the mid-point (0 V) of the AC-coupled differential signal. Equalization shall be off during jitter testing. All XLAUI / CAUI channels shall be active during transmit jitter testing to ensure any channel-channel crosstalk is included in the jitter evaluation.
IEEE P802.3ba D1.1 40Gb/s and 100Gb/s Ethernet comments

Comment ID # 266

Cl 83A SC 83A.5.1 P 362 L 45 # 266
Latchman, Ryan Gennum Corp

Comment Type E Comment Status A
No input on eye template measurements. Remove section.

Suggested Remedy
Remove

Response Response Status C
ACCEPT IN PRINCIPLE.
Also remove reference in 83A.3.4.2

"The template measurement requirements are specified in 83A.5.1."

Comment ID # 267

Cl 83A SC 83A.5.2 P 363 L 19 # 267
Latchman, Ryan Gennum Corp

Comment Type T Comment Status A
Editor's comments replace with text. Remove:
[Editor's note: (to be removed prior to publication) - Insert or change, to include jitter test requirement]
[Editor's note: (to be removed prior to publication) - need a proposal to use a reference clock recovery unit]
[Editor's note: (to be removed prior to publication) - This section should include at what BER the eye mask has to be met]

Suggested Remedy
Replace with:
The following sections describe how to measure transmit jitter compliance and receive jitter compliance

Response Response Status C
ACCEPT IN PRINCIPLE.
Remove editors notes (proposals not received section 83A.5.1 Eye template measurements Remove 83A.5.2 Jitter test requirements)

Comment ID # 268

Cl 83A SC 83A.5.2.2 P 363 L 38 # 268
Latchman, Ryan Gennum Corp

Comment Type T Comment Status A
Interference Test
Formal text on jitter tolerance / stressed test required

Suggested Remedy
See presentation

Response Response Status C
ACCEPT IN PRINCIPLE.
See latchman_02_0109 text and figure. Add PRBS31 as the test pattern.

Comment ID # 269

Cl 83A SC 83A.5.3 P 363 L 48 # 269
Latchman, Ryan Gennum Corp

Comment Type T Comment Status A
rise fall
Remove section (rise/ fall time measurement is described in rise / fall time section)

Suggested Remedy
Remove 83A.5.3

Response Response Status C
ACCEPT.

See comment 251 (rise fall time is being specified in 83A.3.3.2)

Comment ID # 270

Cl 83A SC 83A.7 P 364 L 1 # 270
Latchman, Ryan Gennum Corp

Comment Type T Comment Status A
Ensure all PICS have corresponding Shall statement

Suggested Remedy
modify text to include shall statements as per the PICS

Response Response Status C
ACCEPT IN PRINCIPLE.
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Cl</th>
<th>SC</th>
<th>Page</th>
<th>Line</th>
<th>Comment</th>
<th>Type</th>
<th>Comment Status</th>
<th>Response</th>
<th>Response Status</th>
<th>Suggested Remedy</th>
<th>Task Force Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>#271</td>
<td>82</td>
<td>82.2.4.7</td>
<td>156</td>
<td>29</td>
<td><em>Receipt of an /S/ on any other octet of TxD indicates an error.</em>. TxD is wrong spelling.</td>
<td>E</td>
<td>A</td>
<td></td>
<td>C</td>
<td>Spelling: TxD should be changed to TXD.</td>
<td></td>
</tr>
<tr>
<td>#272</td>
<td>82</td>
<td>82.2.4.4</td>
<td>155</td>
<td>22</td>
<td>&quot;O0D1D2D3D4D5D6D7&quot; at the Data Block Format column is wrong description.</td>
<td>T</td>
<td>R</td>
<td></td>
<td>C</td>
<td>Should be changed from &quot;O0D1D2D3D4D5D6D7&quot; to &quot;O0D1D2D3C4C5C6C7&quot;</td>
<td></td>
</tr>
<tr>
<td>#273</td>
<td>82</td>
<td>82.2.4.9</td>
<td>156</td>
<td>42</td>
<td>The sentence &quot;Ordered sets consist of a control character followed by seven data characters on the MII.&quot; is wrong description. In Figure 82-5 line 22, Ordered sets consist of data and control characters.</td>
<td>T</td>
<td>R</td>
<td></td>
<td>C</td>
<td>Should be changed from &quot;Ordered sets consist of a Block Type Field followed by three data characters and four control characters on the MII.&quot; or The sentence should be changed properly.</td>
<td></td>
</tr>
<tr>
<td>#274</td>
<td>81</td>
<td>81.3.4</td>
<td>138</td>
<td>20</td>
<td>'signalling' is used at the same time with 'signaling' through the draft 1.1.</td>
<td>E</td>
<td>A</td>
<td></td>
<td>C</td>
<td>I suggest to use one kind of spelling. I suggest 'signaling'.</td>
<td></td>
</tr>
<tr>
<td>#275</td>
<td>86</td>
<td>86.1</td>
<td>247</td>
<td>21</td>
<td>'Minimum range' is written in Table 86-1. In Draft 1.0 comments #78 - #81, it is decided to change 'Minimum range' to 'Required operating range'.</td>
<td>T</td>
<td>A</td>
<td></td>
<td>C</td>
<td>Change 'Minimum range' to 'Required operating range' in Table 86-1.</td>
<td></td>
</tr>
</tbody>
</table>

**Comment ID #276**

Chang, Sun Hyok ETRI

**Comment Type** T Comment Status A

'Signalling' is used at the same time with 'signaling' through the draft 1.1.

**Response** C

I suggest to use one kind of spelling. I suggest 'signaling'.

**Response Status** C

Also a duplicate of #158 and #310.
At line 37, Table 86-18 is referred. However, I think the specifications of multimode fibers is written in Table 86-19.

**Suggested Remedy**

Change 'Table 86-18' to 'Table 86-19'.

**Response**

ACCEPT.

---

At line 37 'operational range requirement', and at line 38 'minimum range requirement' are written. In Draft 1.0 comments #78 and #81, it was decided to write it as 'operating range requirement'.

**Suggested Remedy**

Change 'operational range requirement' to 'operating range requirement'.

**Response**

ACCEPT.

---

There are two Editor's Notes on 83A.5.2.2. One is "interference tolerance test" and the other is "test pattern". This proposal compensates these two items.

**Suggested Remedy**

1. Interference test
   - For the interference test of the high speed backplanes, at least three synchronized-pattern streams are required; one stream is a victim under the test and two adjacent streams are as aggressors.
   - To maximize the interference, aggressors' amplitude should be set at the maximum. And switching timing among aggressors and victim pattern should be same.
   - But the pattern should be different aggressors and victim to increase the simultaneous switching effect.
   - Victim's amplitude should be set at the minimum.

2. Test pattern of the jitter tolerance
   - PRBS31 is good for testing the jitter tolerance of the optical modules, which simply requires the physical characterizations.
   - But for the equipments, the test pattern should include the "Alignment Marker" to drive the alignment circuit.
   - In the large scale of the FPGA / ASIC, the higher percentage usage of the circuit makes the internal power level drifting due to the simultaneous switching.
   - The switching reduces the jitter tolerance margin of the chips in the asynchronous clocks.
   - Inside of FPGA / ASIC, there are two different clocks to drive 66bit logic block and 64bit logic block.
   - Between these asynchronous clocks, the amount of jitter is difference. So this makes jitter tolerance worse.
   - To test the switching affects of the equipment the test pattern of the jitter tolerance test should include the "Alignment Marker".

For more detail about test system and test pattern, please refer to presentation.

**Response**

ACCEPT IN PRINCIPLE.

See resolution in comment 268
Regarding the skew values at SP3 & SP4, they should be revised considering the flexible Optical MUX/DEMUX device selection. In case of using 1x2 port O-MUX/DEMUX devices, the skew of 10nm each (for Sending & Receiving portion, respectively) is necessary.

**Suggested Remedy**
Regarding Table80-3, the skew value at SP3 & SP4 should be revised. SP3: 44ns-->53ns, 454UI-->547UI, 227UI-->273UI SP4: 144ns-->136ns, 1484UI-->1403UI, 742UI-->701UI

Related sections below should be revised accordingly,
Sec 84.5 The 3rd & 4th paragraph
Sec 86.2.2 The 3rd & 4th paragraph
Sec 87.3.2 The 3rd & 4th paragraph
Sec 88.3.2 The 3rd & 4th paragraph

There exists a presentation on this issue.

**Response**

ACCEPT IN PRINCIPLE.

[Editor’s note: This comment also affects Clause 84, Clause 85, Clause 86, Clause 87, and Clause 88]

Move skew point 5 and 6 as per slide 6 and adopt maximum skew values from slide 7 in isono_01_0109.

Apply these skew limits throughout the rest of the draft.

Also see comment #445

---

Delay constraints are marked TBD. There is no clear reason why the 40GBASE-KR requirements should differ significantly from 10GBASE-KR requirements.

**Suggested Remedy**
Remove "(TBD)" and text highlighting to set the PMD plus medium delay to 1024 bit times. Also remove the TBD and highlighting to indicate that the assumed delay through the medium is 160 bit times.

**Response**

ACCEPT.
The numbers need to be four times those of Clause 72.
Change TBD (1024) to 4096 and TBD (160) to 640.
See comment 87

---

Text does not make the relationship between Total Skew and Dynamic Skew clear. Is Total Skew the average difference between the earliest PCS lane and the latest, or is it the maximum difference. In other words, is Dynamic Skew as subset of Total Skew, or is Dynamic Skew to be added to Total Skew?

**Suggested Remedy**
Modify text to clarify the intended relationship.

**Response**

ACCEPT IN PRINCIPLE.
Change:
"Total Skew is defined as the difference between the times of the earliest PCS lane and latest PCS lane for the one to zero transition of the alignment marker sync bits. Dynamic Skew is defined as the change in Total Skew over the time that the link is operational." To:
"Skew is defined as the difference between the times of the earliest PCS lane and latest PCS lane for the one to zero transition of the alignment marker sync bits. Skew Variation is defined as the difference between the lowest value of Skew and the highest value of Skew over the entire time that the link is in operation."

Throughout the rest of the draft change "total skew" to "skew" and "dynamic skew" to "skew variation"
Figure 80-3 does not apply to 40GBASE-KR4.

**Suggested Remedy**
Remove reference.

**REJECT.**
Yes it does for the case with a separate FEC chip.

---

Data dependent pulse width shrinkage (DDPWS) does not need to be addressed for 40GBASE-CR4 and 100GBASE-CR10.

1. DDPWS measured at TP2 will be a function of the equalization state of the transmitter. Since 40GBASE-CR4 and 100GBASE-CR10 intend to use the 10GBASE-KR start-up protocol to automatically optimize the equalization state for the channel and receiver, the DDPWS required at this point will also be a function of the channel and receiver.

2. The copper cable assembly is a linear and passive medium. DDPWS measured at each point in the link is a function inter-symbol interference which can be readily mitigated with an appropriate combination of transmitter and receiver equalization. In contrast, optical link designs control the DDPWS at the input to, and output of, non-linear functions such as laser drivers and limiting amplifiers whose outputs in turn drive channels of limited bandwidth. The DDPWS at the output of the non-linear function cannot be completely equalized and furthermore these narrow pulses are most severely impacted by the channel that follows.

3. Duty cycle distortion (DCD) at the transceiver output for linear passive is analogous to DDPWS for optical links and is the appropriate parameter for this clause.

**Suggested Remedy**
Remove editor's note.

**ACCEPT.**
Recommended coupling capacitor value is TBD. This value should be set to 100 nF in accordance with 10GBASE-KR and to avoid additional link penalties associated with baseline wander.

**Suggested Remedy**
Per comment.

**ACCEPT.**
Recommended coupling capacitor value is TBD. This value should be set to 100 nF in accordance with 10GBASE-KR and to avoid additional link penalties associated with baseline wander.

---

Reported insertion loss deviation at 5.15625 GHz does not appear to be consistent with 85.10.

**Suggested Remedy**
Please correct to be consistent.

**ACCEPT IN PRINCIPLE.**
Suggested remedy comment #300
Cl 85 SC 85.9.2 P 228 L 8 # 287
Healey, Adam LSI Corporation

Comment Type: T  Comment Status: A
Note states that "2.5 dB of the 3 dB signal-to-noise ratio penalty related to insertion loss deviation embodied in 802.3ap ICRmin is applied as 2.5 dB ICRchmin margin to account for reduction in ILD penalty for CR4 and CR10."

While the more stringent ILD limits for the cable assembly shown in 85.10.3 would imply a reduction of ILD penalty, it is not obvious that the ILD penalty for the _channel_ is reduced by 2.5 dB. The ILD penalty is a function of the cable assembly ILD, transmit and receive PCB trace impedances, and transmitter and receiver return loss.

Suggested Remedy
Supply analysis that supports the assertion that the ILD penalty is reduced by 2.5 dB. A presentation that investigates this issue will be presented to the Task Force.

Response: C

(1) Explicitly define the channel insertion loss limit chIL=Cable assembly IL+TX_PCB+RX_PCB
(2) channel insertion loss deviation (ILD) specifications = cable assembly ILD specifications equation 85-16 and 85-17
(3) channel RL = cable assembly RL equation. Equation 85-18 and 85-19 in Draft 1.2.

See healey_01_0109.pdf slide #7.

Cl 45 SC 45.2.1.12c P 51 L 46 # 288
Szczepeanek, Andre Texas Instruments

Comment Type: ER  Comment Status: A
The PRBS31 pattern testing error counter is a twelve bit count as defined in 83.6.7

There is no sub-clause 83.6.7 in Draft 1.1

Suggested Remedy

Response: C

ACCEPT IN PRINCIPLE.

(comment subclause designation)

Accept the proposed changes.

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

Comment ID # 289
Page 50 of 141
2/7/2009 12:56:16 PM
Cl 82 SC 2.4.9 P 156 L 42 # 290
Szczepanek, Andre Texas Instruments
Comment Type T Comment Status A
Ordered sets consist of a control character followed by seven data characters on the MII.
SuggestedRemedy
Ordered sets consist of a control character followed by three data characters followed by 4 zero data characters on the MII.
Response Response Status C
ACCEPT.

Cl 69B SC P 345 L # 291
Marris, Arthur Cadence
Comment Type T Comment Status R
Multilane correlated cross needs to be described in Annex 69B
SuggestedRemedy
As above
Response Response Status C
REJECT.
Need a suggested remedy

Cl 74 SC 74.4 P 102 L 1 # 292
Marris, Arthur Cadence
Comment Type T Comment Status A
Need to remove gearbox for 40G and 100G operation as this has a bit stream interface
SuggestedRemedy
As above and also check for any places where Clause 74 needs to be updated for the 40G/100G service interface definition.
Response Response Status C
ACCEPT IN PRINCIPLE.
see response to comment 351

Cl 83 SC 83.5.9 P 192 L 35 # 293
Cole, Chris Finisar
Comment Type T Comment Status A
PMA test patterns sub-clause states in the text that PMA test patterns maybe optionally generated (line 38). However, the title of the sub-clause does not state that it is optional, which may lead to confusion that PMA test patterns have to be supported in a PMD.
SuggestedRemedy
The title of the sub-clause should be changed to:
PMA test patterns (optional)

Further clarification should be added that if the PMA contains a SerDes function (for example 10-4 as in 100GBASE-LR4 and 100GBASE-ER4) then test pattern support is not optional, and test patterns have to be supported.

Further clarification should be added that if the PMA does not support test patterns, then sub-clause 83.5.7 is not optional, and PMA system loopback mode must be supported. In other words, either PMA test patterns are optional or PMA PMA system loopback is optional, but not both. This is to permit verification of nAUI functionality by the host.

Response Response Status C
ACCEPT IN PRINCIPLE.

Adding (optional) to the titles as requested is OK. But test patterns remain optional without task force consensus to change this.
Annex 83A (XLAUI and CAUI) only specifies a chip to chip (i.e. component to component) interface and does not specify a chip to module (i.e. component to module) interface.

The optical interfaces specified in sub-clause 87 (40GBASE-LR4) and sub-clause 88 (100GBASE-LR4 and 100GBASE-ER4) require a chip (component) to module XLAUI and CAUI interface, respectively. Unfortunately, the nAUI terminating component test points inside the module are not available as compliance or test points. They are permanently mounted inside the module, and the only available compliance and test points are at the module pins. This means that for sub-clause 87 and sub-clause 88, the electrical interface is not specified. The chip to chip specifications are not usable.

Suggested Remedy
Annex 83B 40Gb/s Attachment Unit Interface (XLAUI) and 100Gb/s Attachment Unit Interface (CAUI) should be added, which mirrors all the specifications in Annex 83A but with different values. While it is preferable for Annex 83B to be Normative, it can be discussed if Annex 83B could be Informative.

Block diagram, 83A.2.2 becomes block diagram 83B.2.2 with the right side box name changed from XLAUI/CAUI component to XLAUI/CAUI module.

All the specification in 83B then only apply to right side (module) test points The left hand side, or component or chip test points, are still specified in Annex 83A.

The updated specifications for the module test points can be based on the following channel parameters, which can be further discussed to get general agreement as to the appropriate values:

- Max module trace length 3"
- Max module vias: 2
- Max host trace length 8" (or 6"
- Max host vias: 2

Connector limits (similar to XFP connector):
- Max connector insertion loss: 0.5dB at 5GHz
- Max connector return loss: 21dB at 5GHz
- Max crosstalk: 36dB at 5GHz

Compliance curves can be generated based on these limiting values.

Response
ACCEPT IN PRINCIPLE.
Add annex 83B
Add figures illustrating compliance points and table illustrating loss budget at 5.5GHz per
DiMinico, Christopher  
MC Communications  

Comment Type: T  
Comment Status: A

Remove editors note.

Suggested Remedy

[Editor's note (to be removed prior to publication) - The ambiguity between the requirements of 85.8.4.1 and subclause 71.7.2.1, receiver interference tolerance, which references Annex 69A, needs to be resolved.]

See presentation material to be submitted in support of Clause 85 Draft 1.1 comment resolutions.

Response:  
Response Status: C

ACCEPT IN PRINCIPLE.

Remove editors note.

---

DiMinico, Christopher  
MC Communications  

Comment Type: T  
Comment Status: A

Remove editors note. Subclause 85.7.5 text is sufficient to describe lane-by-lane signal detect function.

Suggested Remedy

Remove editors note line 40-41.

Response:  
Response Status: C

ACCEPT.
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Type</th>
<th>Status</th>
<th>Comment Type</th>
<th>Suggested Remedy</th>
</tr>
</thead>
</table>
| 302        | TR   | A      | TR           | Remove TBDs - 85.10 Cable assembly characteristics.
          |      |        | 85.10.2      | 85.10.2 Cable assembly insertion loss - equation (85-9) |
|            |      |        | 85.10.3      | 85.10.3 Cable assembly insertion loss deviation (ILD) - equation (85-16 and 85-17) |
|            |      |        | 85.10.8      | 85.10.8 Cable assembly insertion loss to crosstalk ratio (ICRCA) - equation (85-23) |

<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Type</th>
<th>Status</th>
<th>Comment Type</th>
<th>Suggested Remedy</th>
</tr>
</thead>
</table>
| 303        | TR   | A      | TR           | Remove TBDs - 85.10 Cable assembly characteristics.
          |      |        | 85.10.2      | 85.10.2 Cable assembly insertion loss - equation (85-9) |
|            |      |        | 85.10.3      | 85.10.3 Cable assembly insertion loss deviation (ILD) - equation (85-16 and 85-17) |
|            |      |        | 85.10.8      | 85.10.8 Cable assembly insertion loss to crosstalk ratio (ICRCA) - equation (85-23) |

See diminish_02_1108.pdf.

Response: ACCEPT.

<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Type</th>
<th>Status</th>
<th>Comment Type</th>
<th>Suggested Remedy</th>
</tr>
</thead>
</table>
| 304        | TR   | A      | TR           | Remove TBDs - 85.10 Cable assembly characteristics.
          |      |        | 85.10.2      | 85.10.2 Cable assembly insertion loss - equation (85-9) |
|            |      |        | 85.10.3      | 85.10.3 Cable assembly insertion loss deviation (ILD) - equation (85-16 and 85-17) |
|            |      |        | 85.10.8      | 85.10.8 Cable assembly insertion loss to crosstalk ratio (ICRCA) - equation (85-23) |

The measurements of Total Skew and Dynamic Skew are outside the scope of an interoperability standard i.e., 802.3ba.

Suggested Remedy: Delete sentence: The measurements of Total Skew and Dynamic Skew are defined in 85.xx.xx.

Response: ACCEPT.

<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Type</th>
<th>Status</th>
<th>Comment Type</th>
<th>Suggested Remedy</th>
</tr>
</thead>
</table>
| 305        | TR   | A      | TR           | Remove TBDs in Table 85-4-Transmitter characteristics' summary.
          |      |        | 85.10.2      | Remove editors note line 32-36 page 223. Consider removing any other editors notes in this subclause that are not addressed by specific comment(s) proposal(s) against draft 1.1. |
|            |      |        | 85.10.3      | CR4 and CR10 channel characteristics consistent with 10GBASE-KR. Table 85-4 Transmitter characteristics to be met at TP0 for consistent test/reference point consistent with 10GBASE-KR channel. |

Suggested Remedy: Remove TBDs in Table 85-4-Transmitter characteristics summary.

Remove editors note line 32-36 page 223. Consider removing any other editors notes in this subclause that are not addressed by specific comment(s) proposal(s) against draft 1.1.

See supporting material to be submitted in support of Clause 85 Draft 1.1. comment resolutions.

Response: ACCEPT.

For sub-task force review of supporting presentation diminishco_04_0109.pdf
Comment Type: TR/technical required

Comment Status: A

Remove TBDs Table 85-5-Receiver characteristics' summary. Remove editors note lines 49-54 page 225.

CR4 and CR10 transmitter and channel characteristics consistent with 10GBASE-KR therefore 10GBASE-KR receiver is sufficiently specified.

Suggested Remedy

Remove TBDs Table 85-5-Receiver characteristics' summary. Remove editors note line 32-36 page 223.

See presentation material to be submitted in support of Clause 85 Draft 1.1. comment resolutions.

Response: ACCEPT.

See presentation material to be submitted in support of Clause 85 Draft 1.1. comment resolutions. diminico_04_0109.pdf

Comment Type: TR/technical required

Comment Status: A

Define Table 85-4 Transmitter characteristics to be met at TP0 for consistent test/reference point consistent with 10GBASE-KR.

In addition, to maintain test/reference point at TP2, specify transmitter characteristics to be met at TP2 to account for Tx_PCB, mated connector, and test fixture insertion loss between TP1 and TP2.

Suggested Remedy

(1) Page 223 line 1 replace TP2 with TP0.

Transmitter characteristics in Table 85-4 shall meet specifications at TP0, unless otherwise noted.

(2) Page 225 line 6-7 replace 85.8.3 with new reference for TP2 transmitter characteristics including TP2 transmitter characteristics. See supporting presentation for recommended transmitter characteristics at TP2.

(3) Update resultant changes in PICs.

(4) Page 219 line 46-54 revise text in subclause 85.7.1 Link block diagram..add reference to TP0.

(5) Add TP0>>>The electrical transmit signal is defined at (TP0) and TP2.

(6) Replace current reference to TP2 with TP0 in sentence>> Unless specified otherwise, all transmitter measurements and tests defined in Table 85-4 are made at TP0.

(7) Add sentence to link TP2 with adjusted transmit characteristics>>Unless specified otherwise, all transmitter measurements and tests defined in Table 85-X are made at TP2.

(8) Revise 85.8.3.1 Test fixtures and 85.8.3.2 Test-fixture impedance to reference 10GBASE-KR including the return loss TBD and add additional text for testing at TP2.

See presentation material to be submitted in support of Clause 85 Draft 1.1. comment resolutions.

Response: ACCEPT.

See suggested remedy comment#307. and supporting presentation diminico_04_0109.pdf
Remove TBDs for the SFF-8642 connector.

The connector for each end of the cable assembly shall be the SFF-8642 plug with the mechanical mating interface defined by IEC XXXXX-X-XX and illustrated in Figure 85-14.

The MDI connector shall be the SFF-8642 receptacle with the mechanical mating interface defined by IEC XXXXX-X-XX and illustrated in Figure 85-15.

Accept in principle.

For sub-task force discussion.

“signalling” should be “signaling”

See presentation material to be submitted in support of Clause 85 Draft 1.1. comment resolutions.

Accept in principle.

See remedy in comment #285.
The text describes the MMD register numbering scheme.

"By default, the PMA sublayer that is closest to the PMD is addressed as MDIO Manageable Device (MMD) 1. More addressable instances of PMA sublayers, each one separated from lower addressable instances by chip-to-chip interfaces, may be implemented and addressed as MMD 8, 9 and 10, where MMD 8 is the closest to the PMD..."

The PMA closest to the PMD seems to be numbered both 1 and 8 in this part of the text, but it is clear later on that MMD 8 is for the second-closest PMA to the PMD.

Suggested Remedy
Change the text to read:
"where MMD 8 is the second closest to the PMD.."

Response
ACCEPT.

[Editor's note: The commenter did not indicate the comment type, hence added comment type as Technical] Also addressed comment 180.

Most of the register descriptions subsections seem to go from most significant bit to least significant. This section goes the other way - from bit zero to bit fifteen. Spot checking the full clause 45- it looks like msb->lsb is the normal order.

Other subsections with the same problem:
45.2.1.81a
45.2.1.81b
45.2.1.84
45.2.1.85
45.2.3.4.4
45.2.3.4.5

There may be others, so if this matters, please double check the other sections.

Suggested Remedy
Flip the order of the subsections.

Response
REJECT.

(added subclause designation)

All of the registers added by 802.3ap (Backplane) have been numbered in this way, for reasons only known to the editors of that project. This project should not change the order of some of these registers while leaving the others. Therefore the job of making things consistent should be left to a revision project (where the whole document is open for change).

The block labeled "TSEST_SH2" should be "TEST_SH2"

Suggested Remedy
Change label to "TEST_SH2"

Response
ACCEPT.
Cl. 82: SC 2.18.3 P 170 L 24 # 315
Ofelt, David
Juniper Networks

Comment Type: E Comment Status: A
Figure 82-11

Goto labels are different style than other figures.

Figure 82-14 on page 172 has house shaped boxes for the gotos and circled letters for the destination markers, but 82-11 just has plain letters.

Suggested Remedy
Make the figure style consistent.

Response: Response Status: C
ACCEPT.

Cl. 45: SC 45.2.1 P 37 L 12 # 316
Ofelt, David
Juniper Networks

Comment Type: T Comment Status: A

The editors note asks if a figure describing the PMA numbering as well as possibly showing the system and line loopback definitions would be useful.

Suggested Remedy
I think it would be useful to have a figure in this section clearly showing the PMA addresses for each level. Pictorially showing what the "line" and "system" loopbacks are would also make the document clearer.

An alternative to adding a figure here would be to reference the figure 83-2 for the PMA numbering (and to add the numbers to the figure rather than just having them in the text in 83.1.4 p183 line 43) and figure 83-5 for the loopback definition. That said, a new figure would likely be better.

Response: Response Status: C
ACCEPT IN PRINCIPLE.

(Changed subclause designation)

See comment #344 response
The text says that the PCS sends out the test pattern on four or twenty lanes simultaneously and then goes on to say that the scrambler generates the test pattern. I think the text would be clearer if it made explicit that the test pattern is generated as a single stream by the scrambler and then distributed to the lanes in the same way as normal packet data coming from the upper layers.

**Suggested Remedy**

Move the third paragraph to be the first in the subsection, then change the current first to read something like:

"When the transmit channel is operating in test-pattern mode, the encoded data stream is distributed to the PCSL in the same way as normal packet data. There will be four separate data streams ..."

**Response**

**Response Status**: C

ACCEPT IN PRINCIPLE.

Change:

"When the transmit channel is operating in test-pattern mode, it sends the test pattern in 4 separate data streams (for 40GBASE-R) or 20 separate data streams (for 100GBASE-R) of test pattern at a time via PMA_UNITDATA.request primitives. The test-pattern generator shall be implemented.

There is a single type of required PCS transmit test pattern: pseudo-random. The pseudo-random test-pattern mode is suitable for receiver tests and for certain transmitter tests.

When pseudo-random pattern is selected, the test pattern is generated by the scrambler. No seeding of the scrambler is required during test pattern operation. The input to the scrambler is a control block (block type=0x1e) with all idles as defined in figure 82-5. Note that the alignment markers are also added to the stream so that the receive PCS can align and deskew the lanes."

To:

"The PCS shall generate and detect a scrambled idle test pattern. This test-pattern mode is suitable for receiver tests and for certain transmitter tests.

When scrambled idle pattern is selected, the test pattern is generated by the scrambler. No seeding of the scrambler is required during test pattern operation. The input to the scrambler is a control block (block type=0x1e) with all idles as defined in figure 82-5. Note that the sync headers and alignment markers are added to the stream so that the receive PCS can align and deskew the lanes.

When the transmit channel is operating in test-pattern mode, the encoded bit stream is distributed to the PCS Lanes as in normal operation."
Cl  86  SC  86.7.3.2.1  P  265  L  12  #  321
CHANG, Frank  Vitesse
Comment Type E  Comment Status A
SuggestedRemedy
Center the Eq.86-4.
Response Response Status C
ACCEPT IN PRINCIPLE.
Other equations moved to indented left per house style.

Cl  83  SC  83.1.4  P  183  L  4348  #  322
CHANG, Frank  Vitesse
Comment Type ER  Comment Status A
MDIO serial interface first appear for clause 83.
SuggestedRemedy
MDIO stands for the Management data input/output interface, specifed in 802.3ae clause 45.
Response Response Status C
ACCEPT IN PRINCIPLE.
Since clause 45 has existed for some time, only need to reference clause 45 (no need to single out 802.3ae)

Cl  83  SC  83.5  P  189  L  724  #  323
CHANG, Frank  Vitesse
Comment Type ER  Comment Status A
Depending CDR or serdes implementation, PMA don't have to recover clock from the received signal if for CDR.
SuggestedRemedy
"....optionally to recover clock from the received signal, and to provide test signals...."
Response Response Status C
ACCEPT IN PRINCIPLE.
Overtaken by events. See comment 395 resolution.

Cl  83  SC  83.5.5  P  191  L  3139  #  324
CHANG, Frank  Vitesse
Comment Type ER  Comment Status R
Assume 87.2 will also specify PMD service interface (for 40G-LR4), expecting 40G-LR4 will likely implement the similar limiting interface based on 4xLR.
SuggestedRemedy
Should add 87.2.
Response Response Status C
REJECT.
40G-LR4 is patterned after 100G-LR4, and we are not specifying a physical instantiation for the PMD service interface in that case.

Cl  83  SC  83.5.9  P  192  L  3546  #  325
CHANG, Frank  Vitesse
Comment Type ER  Comment Status R
to define various test patterns.
SuggestedRemedy
Suggest add the following paragraph:
PMA test patterns can be the square wave, PRBS31, and mixed-frequency test patterns as described in section 50.3.8 of IEEE Standard 802.3ae as well as the Test Signal Structure (TSS) and continuous identical digits (CID) pattern....
Response Response Status C
REJECT. Agreed test patterns are square 8, PRBS31, PRBS9 (based on other comments), and scrambled idles from the PCS, which are all described in the text.
Comment Type: TR  Comment Status: R
Comment on PMA loopback modes, pattern generator and checkers.
As indicated by nicholl_01_1108.pdf, every 10GbE PHY device supports some kinds of PMA Loopbacks. I would recommend 802.3ba adopt at least PMA line loopback as mandatory which is extremely useful for RX SRS test.

Actually currently IC advances has enabled the implementation of much more test features such as embedded BER monitoring, waveform viewing etc. I plan to provide some slides for this.

Suggested Remedy
Suggest to eliminate optional for g) and add the following after h)-
"The system and line loopback modes can be useful for both physical-layer test and debug purpose such as RX SRS test."

Response  Response Status: C
REJECT.
Making loopback mandatory would require TF consensus. See comment #590 resolution for discussion of why line loopback may be burdensome in some cases.

Comment Type: TR  Comment Status: A
Refering to Fig. 83-2, {1,2,4} or {1,2,4,5,10,20} causes confusions for PMA input/output lanes.

Suggested Remedy
Actually only one option {4} for 40G-R; while \{4,10,20\} for 100G-R.

Or to take the whole paragraph out.

Response  Response Status: C
ACCEPT IN PRINCIPLE.

Change "The number of input lanes and the number of output lanes for a PMA are always divisors of the number of PCSLs. For PMA sublayers supporting 40GBASE-R PMDs, the number of PCSLs is 4, so the number of input lanes and output lanes are selected from the set \{1, 2, 4\}. For PMA sublayers supporting 100GBASER PMDs, the number of PCSLs is 20, so the number of input lanes and output lanes are selected from the set \{1, 2, 4, 5, 10, 20\}."
to
"The number of input lanes and the number of output lanes for a PMA are always divisors of the number of PCSLs. For PMA sublayers supporting 40GBASE-R PMDs, the number of PCSLs is 4, and for PMA sublayers supporting 100GBASER PMDs, the number of PCSLs is 20."

Comment Type: TR  Comment Status: R
Recommend 802.3ba adopt at least PMA line loopback as mandatory which is extremely useful for RX SRS test.

Suggested Remedy
Take out (optional)??

Response  Response Status: C
REJECT.
Needs consensus of TF to make this mandatory. See comment 624 about why line loopback may be difficult for some implementations.
Refering to Fig. 86-3, TP1a could be critical interface between module to host board. Taking into account of existing SFP+ implementation, pre-emphasis would be likely necessary for system robustness.

**SuggestedRemedy**

Suggest to add a row into Table 86-6 for transmit pre-emphasis with optional pre-emphasis as 6dB (or TBD), plan to present one slide.

**Response**  **Response Status** C

REJECT.

This comment was WITHDRAWN by the commenter.

An additional specification at TP1a for transmitter pre-emphasis is not needed as the existing eye mask and jitter specifications are adequate.

**Comment ID # 333**

Refering to baseline proposal pepeljugoski_01_0508.pdf, in slide#13 PMD will with PMA as a CDR, possibly with simple EDC. The allocation for penalties (6.4dB) and power budget (8.3dB) could be too pessimistic.

**SuggestedRemedy**

Plan to address this from the slides for SRS test.

**Response**  **Response Status** C

REJECT.

[Editor's note:Line number was 1630]

Changes to the optical power budget need justification.

**Comment ID # 332**

From the experience of LRM and SFP+, PRBS9 should be the short pattern

**SuggestedRemedy**

PRBS9 in Table 86-15.

Same in Table 87-10.

**Response**  **Response Status** C

ACCEPT IN PRINCIPLE.

See response to comment 505.

See also comments 562, 473, 563, 564, 205, 463, 460, 634, 462, 565.
Comment Type: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID

## Cl 87 SC 87.2 P 281 L 3742 # 334
CHANG, Frank Vitesse

**Comment Type** TR  **Comment Status** R
Baseline proposal cole_01_0908.pdf did not indicate clearly module implementation (Slide#4). I feel it's quite likely 40GBASE-LR4 will be based on 4x10GBASE-LR with CDR in the host, similar to 40GBASE-SR4, using limiting interface instead of retimed interface like XLAUI. So there is possibility that PMD service interface may be the actual interface between module and host, so not in an abstract manner.

**Suggested Remedy**
Go ahead to define Tp1 or Tp4 specs??

**Response**
**Response Status** C
**REJECT.**
Insufficient detail has been provided. Detailed proposals for how this would be implemented in the draft would be required.

## Cl 99 SC P 5 L 27 # 335
Ganga, Ilango Intel

**Comment Type** ER  **Comment Status** A
Check with 802.3 Chair and add new sections to the front matter regarding "Laws and regulations", "copyright" message and "revisions" to IEEE documents. See 802.3av-D2.2 front matter for reference.

**Suggested Remedy**
As per comment.

**Response**
**Response Status** C
**ACCEPT IN PRINCIPLE.**
Replace the front matter with the revised 2009 front matter.

## Cl 01 SC 1.3 P 22 L 49 # 336
Ganga, Ilango Intel

**Comment Type** ER  **Comment Status** A
New references have been added to 1.3, hence delete Editor's note.

**Suggested Remedy**
Delete the Editor's note in 1.3

**Response**
**Response Status** C
**ACCEPT.**
Comment Type: ER  Comment Status: A
Rephrase the PMD description in the list as follows to match the definition of PMDs in 1.4.

Suggested Remedy
Change the following definition in the list as suggested:

"40GBASE-R PCS/PMA over 4 WDM lane single mode fiber PMD, with long reach, as specified in Clause 87."

"100GBASE-R PCS/PMA over 4 WDM lane single mode fiber PMD, with long reach, as specified in Clause 88."

"100GBASE-R PCS/PMA over 4 WDM lane single mode fiber PMD, with extended reach, as specified in Clause 88."

Response  Response Status: C
ACCEPT.

Comment Type: ER  Comment Status: A
Since there are no changes identified for 30.2.5 Capabilities, delete this subclause title.

Suggested Remedy
Delete 30.2.5 Capabilities

Response  Response Status: C
ACCEPT.

Comment Type: ER  Comment Status: A
Delete Editor's note below Clause 45 title

Suggested Remedy
Add the following subclause title "45.2 MDIO Interface Registers" next to Editing instructions, since table 45-1 is under subclause 45.2

Suggested Remedy
As per comment

Response  Response Status: C
ACCEPT.

See also #192
Ganga, Ilango Intel

**Comment Type**: T

**Comment Status**: A

Provide a diagram to show how multiple PMA sublayers are addressed and delete the Editor's note.

An example illustration will definitely help as this is the first time such multiple PMA instances are addressed.

Also clarify the second sentence in 45.2.1 on line 2 "These sublayers are all addressed by MMD 1 by default, but may also be instantiated in multiple addressable instances."

As per this statement if all sublayers can be addressed by MMD1 by default, provide explanation on how this is performed.

**Suggested Remedy**

Provide a diagram and additional clarification for second sentence in 45.2.1

**Response**

**Response Status**: C

ACCEPT IN PRINCIPLE.

Fig 83-2 shows the multiple sublayers.

Add a reference to fig 83-2 and Annex 83B and change:

"These sublayers are all addressed by MMD 1 by default, but may also be instantiated in multiple addressable instances."

to:

"By default, these sublayers are all implemented as one instance addressed by MMD 1. Alternatively they may be implemented in multiple addressable instances with separate MMD addresses."

---

Ganga, Ilango Intel

**Comment Type**: TR

**Comment Status**: A

30.5.1.1.15 aFECCorrectedBlocks counter needs to be enumerated for 4 lanes and 20 lanes for multilane BASE-R Phys

30.5.1.1.16 aFECUncorrectableBlocks counter is defined as a single counter, this needs to be enumerated for 4 and 20 lanes for multilane BASE-R PHYs

**Suggested Remedy**

Update 30.5.1.1.15 and 30.5.1.1.16 to include multiple FEC counters for 4 and 20 lanes for BASE-R PHYs and update the text and cross references to registers in Clause 45 accordingly.

**Response**

**Response Status**: C

ACCEPT IN PRINCIPLE.

The commenter does not provide much detail in the remedy.

Change 30.5.1.1.15 as follows:

First sentence of SYNTAX to read: "Array of generalized nonresetable counters."

Add initial paragraph into BEHAVIOUR:

"An array of counters enumerated as counters 0 to N-1, where N is the number of PCS lanes in use. Each counter applies to the corresponding lane and behaves in the following manner."

Also change the references to:

45.2.8.5, 45.2.1.86 and 45.2.1.87a

Change 30.5.1.1.16 in the same manner, with the references changing to:

45.2.8.6, 45.2.1.87 and 45.2.1.87b
### Comment 346

**Comment Type**: T  
**Comment Status**: A  
30.6.1.1.5 aAutoNegLocalTechnologyAbility

Mapping of FEC Requested bit is missing in the list for aAutoNegLocalTechnologyAbility attribute.  
This has been missing in the base spec as well.  

**Suggested Remedy**: 
Add the following sentence to the list below "FEC Capable"  
FEC Requested   FEC Requested as specified in Clause 73 (See 73.6.5) and Clause 74.  
Also update the sentence for FEC Capable to included reference to Clause 73 and Clause 74 as follows:  
FEC Capable   FEC ability as specified in Clause 73 (See 73.6.5) and Clause 74.  

**Response**:   
ACCEPT.

---

### Comment 347

**Comment Type**: ER  
**Comment Status**: A  
74.3  BASE-R FEC relationship to ISO/IEC Open Systems Interconnection (OSI) reference model and the IEEE 802.3 CSMA/CD LAN model  

**Suggested Remedy**: 
Change Figure 74-1 title as follows:  
BASE-R FEC relationship to ISO/IEC Open Systems Interconnection (OSI) reference model and the IEEE 802.3 CSMA/CD LAN model  

**Response**:   
ACCEPT IN PRINCIPLE.  
see response to comment 392

---

### Comment 348

**Comment Type**: ER  
**Comment Status**: A  
74.5.2  The FEC service interface directly maps to the PMA service interface defined in Clause 83 (See 83.3)  

**Suggested Remedy**: 
Change sentence as follows:  
The FEC service interface directly maps to the PMA service interface defined in Clause 83 (See 83.3)  

**Response**:   
ACCEPT IN PRINCIPLE.  
see response to comment 392

---

### Comment 349

**Comment Type**: ER  
**Comment Status**: A  
74.5.2.2.2  The FEC service interface directly maps to the PMA service interface defined in Clause 83 (See 83.3)  

**Suggested Remedy**: 
Change 10.3125 Gtransfers/s to 10.3125 GBd to be consistent with other subclauses (for example tx_bit is defined in GBd).  
Also change Gbd to GBd throughout this clause.  

**Response**:   
ACCEPT.  
also see comment 162

---

### Comment 350

**Comment Type**: E  
**Comment Status**: A  
74.8  In Table 74-1, change the width of the last column, to fit the variable to fall within a single line. Currently the last digit spills over the next line.  

**Suggested Remedy**: 
As per comment  

**Response**:   
ACCEPT.
74.7.4 Functions within the FEC sublayer, should be updated to include the operation of a bit serial interface for 40GBASE-R and 100GBASE-R PHYs. The reverse gearbox function is not needed. A presentation or text will be provided to show the operation of Clause 74 FEC for operation with 40 and 100G multi lane PHYs.

**SuggestedRemedy**

A supporting presentation will be submitted to show the operation of Clause 74 FEC with multi lane operation with 40GBASE-R and 100GBASE-R PHYs. Text and figures in 74.7.4 needs to be updated accordingly.

**Response**

ACCEPT IN PRINCIPLE.

Implement the changes suggested in ganga_03_0109.pdf. Correct the delay calculations considering 5G lanes for 100GBASE-R. Give pause quanta as well as BT.

Also check for any places where Clause 74 needs to be updated for the 40G/100G service interface definition and fix accordingly. Editorial license.

Also, in 74.7.4.5.1, change (d, e, f) bullets to (a, b, c) and insert line 41 to match base text (retaining change item b)

74.11 PICS and requirements for 40GBASE-R and 100GBASE-R:

Current PICS in 74.11 in base specification applies to 40GBASE-R and 100GBASE-R implementations as well. Add any new PICS entries that are specific to 40GBASE-R and 100GBASE-R PHYs.

For example add separate shall statements in 74.7.4.5 to indicate the decoding errors requirements to PCS for 40GBASE-R and 100GBASE-R. So this will result in separate PICS entries for single lane and multi-PCS lane implementations.

Current statements in 74.7.4.5 does not provide clarity regarding specific requirements for single and multi-PCS lane PHYs.

**SuggestedRemedy**

Update 74.7.4.5 to provide separate requirements for 40GBASE-R and 100GBASE-R PHYs and add corresponding PICS entries. (for e.g. PICS entry FE9 or FE11 in 74.11.5 may get split accordingly)

Also do the same for other requirements of 40GBASE-R and 100GBASE-R in Clause 74, if any.

**Response**

REJECT.

This comment was WITHDRAWN by the commenter.
Comment ID # 353
Ganga, Ilango Intel

Comment Type T  Comment Status A
The FEC_SIGNAL.indication is set to True only if fec_signal_ok variable is true for all lanes or data streams and is set to fail if fec_signal_ok is false in any one or more of the lanes. Hence rephrase the appropriate sentences in 74.5.2.3.1 to provide clarity.

Suggested Remedy
Change two sentences in 74.5.2.3.1 as follows:

"PMA sublayer indicated by the fec_signal_ok variable equal to true, for all data streams, and this payload..."

"A value of FAIL denotes that errors have been detected by the Receive process indicated by the fec_signal_ok variable equal to false, in any of the data streams, that prevent valid data..."

Response  Response Status C
ACCEPT.

Comment ID # 354
Ganga, Ilango Intel

Comment Type TR  Comment Status A
Update the Transmit and Receive delay contributed by 40GBASE-KR4 PMD to 1024 BT and round trip medium delay to 160 BT and remove the TBDs.

Suggested Remedy
In 84.4 Delay constraints change the delay requirements as follows and also update corresponding entry in Table 80-2:

The sum of the transmit and the receive delays contributed by the 40GBASE-KR4 PMD and medium shall be no more than 1024 bit times. It is assumed that the round-trip delay through the medium is 160 bit times.

Response  Response Status C
ACCEPT.

The numbers need to be four times those of Clause 72.

Change TBD (1024) to 4096 and TBD (160) to 640.

See comment 87

Comment ID # 355
Ganga, Ilango Intel

Comment Type T  Comment Status A
Measurement total skew and dynamic skew for 40GBASE-KR4 is not defined and is left to the implementors to comply with the skew requirements.

Hence delete the last sentence of 84.5.

Suggested Remedy
Delete the following sentence at the end of 84.5

The measurements of Total Skew and Dynamic Skew are defined in 84.xx.xx.

Response  Response Status C
ACCEPT.

The numbers need to be four times those of Clause 72.

Change TBD (1024) to 4096 and TBD (160) to 640.

See comment 87
Cl 85 SC 85.4 P 217 L 16 # 357
Ganga, Ilango Intel

Comment Type T Comment Status A

Update the Transmit and Receive delay contributed by the 40GBASE-CR4 and 100GBASE-CR10 PMDs to 2560 BT and round trip medium delay to 1135 BT and remove the TBDs.

SuggestedRemedy

In 84.4 Delay constraints change the delay requirements as follows and also update corresponding entry in Table 80-2:

"The sum of the transmit and the receive delays contributed by the 40GBASE-CR4 and 100GBASE-CR10 PMDs and medium shall be no more than 2560 bit times. It is assumed that the round-trip delay through the medium is 1135 bit times."

Also add the missing "period" at the end of the sentence.

In corresponding PICS "DC" in 85.13.4, do not add absolute delay number in PICS entry instead refer back to the requirements in 85.4. "Value/Comment: Device conforms to Delay constraints specified in 85.4"

Response Response Status C

ACCEPT IN PRINCIPLE. Also add the missing "period" at the end of the sentence.

Suggested remedy comment #300

And, in corresponding PICS "DC" in 85.13.4, do not add absolute delay number in PICS entry instead refer back to the requirements in 85.4. "Value/Comment: Device conforms to Delay constraints specified in 85.4"

Cl 85 SC 85.13.4 P 242 L 32 # 358
Ganga, Ilango Intel

Comment Type T Comment Status A

Add a separate PICS entry for the AN service interface primitive for the PCS associated with CR PMD. (See 84.11.4.1 for reference or Clause 72 in base standard)

SuggestedRemedy

Insert a separate subclause 85.13.4.1 PCS requirements for AN Service interface below and add the PICS entry named PR1 as shown below:

Item: PR1, Feature: AN service interface primitive, Subclause: 85.3, Value/Comment: The PCS associated with this PMD supports the AN service interface primitive AN_LINK.indication defined in 73.9, Status: M, Support: Yes []

Response Response Status C

ACCEPT.

Cl 84 SC 84.7.4 P 205 L 1 # 360
Ganga, Ilango Intel

Comment Type TR Comment Status A

Add a subclause below 84.7.4 for lane by lane signal detect function and renumber the subclauses accordingly.

SuggestedRemedy

Add 84.7.5 PMD lane-by-lane signla detect function

When the MDIO is implemented, each PMD_signal_detect_n value, where n represents the lane number in the range 0:3, shall be continuously updated according to the requirements of 84.7.4.

Add description for lane by lane signal detect 0 to 3 in 84.7.5 (see 84.7.4 for reference or 84.7.4 last paragraph has description for PMD_signal_detect_n).

Add corresponding register bit references to Table 84-1.

Add corresponding PICS entry

Response Response Status C

ACCEPT.
<table>
<thead>
<tr>
<th>Comment ID #</th>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Suggested Remedy</th>
<th>Response</th>
<th>Response Status</th>
<th>Proposed Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>361</td>
<td>84</td>
<td>84.7.5</td>
<td>205</td>
<td>19</td>
<td>T</td>
<td>A</td>
<td>Add a subclause below 84.7.5 for lane by lane transmit disable function and renumber the subclauses accordingly.</td>
<td>Add 84.7.6 PMD lane-by-lane transmit disable function</td>
<td>Add corresponding PICS entry as appropriate.</td>
<td>ACCEPT.</td>
<td></td>
</tr>
<tr>
<td>362</td>
<td>85</td>
<td>85.7.12</td>
<td>223</td>
<td>3</td>
<td>T</td>
<td>A</td>
<td>Add a PICS entry for the requirements specified in 85.7.12 PMD control function. Also update the text in 85.7.12 to indicate the requirement by including a ‘shall’ statement.</td>
<td>Change sentence as follows and add a corresponding PICS entry to 85.13.</td>
<td>ACCEPT.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>363</td>
<td>85</td>
<td>85.7.5</td>
<td>221</td>
<td>40</td>
<td>T</td>
<td>A</td>
<td>Provide description of lane by lane signal detect function in 85.7.5 and delete the Editor's note.</td>
<td>The description for lane by lane PMD_signal_detect_n function is provided in the last paragraph of 85.7.4.</td>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Ganga, Ilango, Intel

TYPE: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Response Status</th>
<th>Comment</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Response Status</th>
<th>Comment</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Response Status</th>
<th>Comment</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Response Status</th>
<th>Comment</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Response Status</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>365</td>
<td>T</td>
<td>A</td>
<td>Update the text in 84.8.1 and 84.8.2 to indicate the Transmit and receive requirements by including a shall statement. Add corresponding shall statements for each requirement.</td>
<td>C</td>
<td>T</td>
<td>A</td>
<td>Include the Rise/fall time requirements in a shall statement and add corresponding PICS entry.</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>366</td>
<td>T</td>
<td>A</td>
<td>Change the following sentences in 84.8 and add corresponding PICS entries to 84.11 to cover those requirements. Transmitter electrical characteristics at TP1 for 40GBASE-KR4 shall be the same as 10GBASE-KR, as detailed in 72.7.1.1 through 72.7.1.11. The same test fixture as 10GBASE-KR shall be used on all lanes as described in 72.7.1.1. The receiver interference tolerance tests shall be the same as those described for 10GBASE-KR in 72.7.2.1 and Annex 69A. Receiver electrical characteristics at TP4 for 40GBASE-KR4 shall be the same as 10GBASE-KR, as detailed in 72.7.1.1 through 72.7.2.5.</td>
<td>C</td>
<td>T</td>
<td>A</td>
<td>Include appropriate multilane cross talk for 40GBASE-KR4 per Editor's note and delete the Editor's note. Add an additional column to Table 83A-1 and provide reference to appropriate subclause where the transmit parameters are specified (See tables in Clause 84 or 85 for reference). Same comment applies to Table 83A-3 Receiver characteristics</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>367</td>
<td>T</td>
<td>A</td>
<td>As per comment</td>
<td>C</td>
<td>T</td>
<td>A</td>
<td>As per comment</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>368</td>
<td>T</td>
<td>A</td>
<td>As per comment</td>
<td>C</td>
<td>T</td>
<td>A</td>
<td>As per comment</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>369</td>
<td>T</td>
<td>A</td>
<td>Include additional examples in an informative annex as per Editor's note and/or delete the Editor's note.</td>
<td>C</td>
<td>T</td>
<td>A</td>
<td>As per comment</td>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Suggested Remedy:

- Change the following sentences in 84.8 and add corresponding PICS entries to 84.11 to cover those requirements.

- Transmitter electrical characteristics at TP1 for 40GBASE-KR4 shall be the same as 10GBASE-KR, as detailed in 72.7.1.1 through 72.7.1.11.

- The same test fixture as 10GBASE-KR shall be used on all lanes as described in 72.7.1.1.

- The receiver interference tolerance tests shall be the same as those described for 10GBASE-KR in 72.7.2.1 and Annex 69A.

- Receiver electrical characteristics at TP4 for 40GBASE-KR4 shall be the same as 10GBASE-KR, as detailed in 72.7.1.1 through 72.7.2.5.

Suggested Remedy:

- Include appropriate multilane cross talk for 40GBASE-KR4 per Editor's note and delete the Editor's note.

- Add an additional column to Table 83A-1 and provide reference to appropriate subclause where the transmit parameters are specified (See tables in Clause 84 or 85 for reference). Same comment applies to Table 83A-3 Receiver characteristics.

Suggested Remedy:

- As per comment.

Type: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general

Comment Status: D/dispatched  A/accepted  R/rejected  RESPONSE_STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn

Sort Order: Comment ID
Comment Type: T  Comment Status: A
Other PMD clauses refer back to this subclause regarding the effect of receipt of this primitive etc. So organize the description of PMA server service interface similar to be consistent with other service interface definitions in Clause 83 and other Clauses.

Suggested Remedy
Organize the description with the following outline as example.

83.4 PMA server service interface:
List all the server interface primitives and provide any overview

83.4.1 PMAservice_UNITDATA.requestx
Move the definition of this primitive under this subclause
83.4.1.2 When generated
83.4.1.3 Effect of receipt

Similarly structure for descriptions of other server interface primitives.

In Figure 83-5 name the primitives as per the exact definition of the primitives, as follows:

PMAservice_UNITDATA.requestx PMAservice_UNITDATA.indicationx PMAservice_SIGNAL.indication

and

PMA_UNITDATA.requestx PMA_UNITDATA.indicationx PMA_SIGNAL.indication

Response  Response Status: C
ACCEPT.
Comment Type T  Comment Status R
Table 88-8 and Table 88-12: 3dB frequency is specified as max frequency (31 GHz). We believe the reason for this is that the device with higher BW should be not able to filter higher harmonics, but it should be important to have some specification about the minimum BW or, taking into account that we refer to limiting devices, at least a spec for jitter.

SuggestedRemedy

Response  Response Status C
REJECT.
[Editor's note: Subclause field changed from 88.7 to 88.7.2 and Line set to 7]
A receiver with too little bandwidth will fail the stressed receiver sensitivity as this is measured with degraded transmitter eye opening.

Comment Type T  Comment Status R
Table 88-12: the -21.4 dBm sensitivity needs to be better defined for the specification for both the PD and the TIA. We should have more information about the overall system:
-APD instead of PIN photodiode?
-Optical amplifier at the TIA input?
We should also consider that if APD of Optical amplifier comes into the picture, it will imply a tight constraint on the overload specification.

SuggestedRemedy

Response  Response Status C
REJECT.
[Editor's note: Subclause field changed from 88.8 to 88.8.2 and Line set to 22]
The 802.3ba specification should not restrict the implementation. Even though the specifications have been generated with an SOA based pre-amplifier in mind, any implementation that meets the specifications is allowed. Overload considerations were discussed in Cole_02_0108.pdf

COMMENT STATUS: D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID
### Comment ID # 379

**Comment Type:** E  **Comment Status:** A  

*Proper name for Task Force is IEEE P802.3.b_a 40Gb/s and 100Gb/s Ethernet Task Force.*

**Suggested Remedy:**
- Replace part of sentence shown with:
  **Draft D1.1 is prepared by the IEEE 802.3.ba 40Gb/s and 100Gb/s Ethernet Task Force.**

**Response**

**Response Status:** C  

*ACCEPT IN PRINCIPLE.*

*Replace part of sentence shown with:*

**Draft D1.1 is prepared by the IEEE P802.3ba 40Gb/s and 100Gb/s Ethernet Task Force.**

*Replace the front matter with revised 2009 front matter and make the above change.*

### Comment ID # 380

**Comment Type:** E  **Comment Status:** A  

**TOC for Clause 73: Subclauses are shown indented under wrong top clauses. For example 73.5.1 is shown indented under 73.3.**

**Suggested Remedy:**
- correct the subclauses so they are shown indented under the correct top clauses.

**Response**

**Response Status:** C  

*ACCEPT IN PRINCIPLE.*

*This is a formatting issue with TOC template, try to obtain revised template for next draft revision.*

### Comment ID # 381

**Comment Type:** E  **Comment Status:** A  

**wrap around error in TOC**

**Suggested Remedy:**
- correct TOC

**Response**

**Response Status:** C  

*ACCEPT IN PRINCIPLE.*

*[Editor's note: Commenter did not indicate comment type, hence added comment type as Editorial]*

*This is a formatting issue with TOC template, try to obtain revised template for next draft revision.*

### Comment ID # 382

**Comment Type:** E  **Comment Status:** A  

**83A.2 is not shown in TOC. Also, 83A.7.2.x is shown indented under 83A7.1.**

**Suggested Remedy:**
- correct properties of 83A.2 so it shows up in ToC.
- Make sure 83A.7.2 is included in ToC, and that subclauses 83A.7.2.x are indented under it.

**Response**

**Response Status:** C  

*ACCEPT IN PRINCIPLE.*

*This is Heading numbering issue in Annex 83A.2 and 83A.7.x. Check and fix the issue in Annex 83A.*
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Response</th>
<th>Response Status</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>383</td>
<td>1.4</td>
<td>23</td>
<td>23</td>
<td>E</td>
<td>A</td>
<td>D'Ambrosia, John</td>
<td>C</td>
<td>The XLAUI is defined as a 4 lane intra-sublayer, but this is actually in only one direction.</td>
</tr>
<tr>
<td>384</td>
<td>1.4</td>
<td>23</td>
<td>44</td>
<td>E</td>
<td>A</td>
<td>D'Ambrosia, John</td>
<td>C</td>
<td>The CAUI is defined as a 10 lane intra-sublayer, but this is actually in only one direction.</td>
</tr>
<tr>
<td>386</td>
<td>30.5.1.1.2</td>
<td>30</td>
<td>4</td>
<td>E</td>
<td>A</td>
<td>D'Ambrosia, John</td>
<td>C</td>
<td>Projects in development include a &quot;P&quot; in front of 802.3xx</td>
</tr>
</tbody>
</table>

**SuggestedRemedy**
- The CAUI is defined as a 10 lane intra-sublayer, but this is actually in only one direction.
- Change "A 10 lane" to "An".
- Projects in development include a "P" in front of 802.3xx.

**SuggestedRemedy**
- Listing of PHYs defines the number of conductors or fibers for medium for simplex operation (includes 40GBASE-CR4, 40GBASE-SR4, 100GBASE-CR10, and 100GBASE-SR10), i.e. 40GBASE-CR4 is over 4 lane shielded copper balanced cable, when actually 40GBASE-CR4 uses 8 lanes, 4 in each direction.

**SuggestedRemedy**
- Two options:
  1. use the number of lanes for full duplex operation
  2. delete the number of lanes and leave in general terms

**Comment ID # 386**

*Editor's note: Commenter did not indicate comment type, hence added comment type as Editorial*
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>387</td>
<td>45</td>
<td>52</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>388</td>
<td>45</td>
<td>56</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>390</td>
<td>69</td>
<td>92</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>391</td>
<td>73</td>
<td>93</td>
<td>29</td>
<td></td>
</tr>
</tbody>
</table>

### Comment Type: E
**Comment Status: A**

**Amendment reads**

The BASE-R PMD control register is used for 10GBASE-KR and other PHY types using the backplane PMD described in Clause 72, 84 or 85.

The PMD is not just for backplanes.

There are multiple instances of this sentence throughout Clause 45.

**Suggested Remedy**

Delete the work "backplane" in the sentence. Do this for all instances of this sentence in Clause 45.

**Response**

ACCEPT.

**Response Status: C**

---

**Response**

ACCEPT.

**Response Status: C**

---

**Response**

ACCEPT IN PRINCIPLE.

---

### Comment Type: E
**Comment Status: A**

The BASE-R PMD status register 2 is used for 100GBASE-CR10 and other PHY types using the PMD described in Clause 72, 84 or 85 over more than 4 lanes.

**Suggested Remedy**

reword sentence

The BASE-R PMD status register 2 is used for 100GBASE-CR10 and other PHY types using the PMD described in Clause 72, 84 or 85 over more than 4 lanes in a given direction.

**Response**

ACCEPT.

**Response Status: C**

---

**Response**

ACCEPT.

**Response Status: C**

---

**Response**

ACCEPT IN PRINCIPLE.

This comment refers to Figure 73-1.

**Response**

ACCEPT.

**Response Status: C**

---

**Response**

ACCEPT.

**Response Status: C**

---

**Response**

ACCEPT.

**Response Status: C**

---

### Comment Type: E
**Comment Status: A**

"BASE-R FEC" is inconsistent with other layer diagrams.

**Suggested Remedy**

Change "BASE-R FEC" to "FEC"

**Response**

ACCEPT.

**Response Status: C**

---

This comment refers to Figure 74-1.
The FEC service interface section does not discuss that the implementation shown in Fig 83-2, where the XLAUI / CAUI is above the FEC sublayer.

**Suggested Remedy**
Add the following sentence at the end of the first paragraph in 74.5:
The XLAUI / CAUI is an optional physical instantiation that may be used for the logical FEC interface.

**Response**
ACCEPT IN PRINCIPLE.
Add sentence after first sentence in first paragraph of 74.5:
"The FEC service interface is equivalent to the PMA service interface."

Add third paragraph to 74.5
"Optional physical instantiations of the PMA service interface have been defined (see Clause 51 and Clause 83). There is XSBI (10 Gigabit Sixteen Bit Interface) for 10GBASE-R, XLAUI for 40GBASE-R and CAUI for 100GBASE-R. These physical instantiations, with a PMA if required, may also be used for the FEC service interface."
also see comment 395 against Clause 83

**Comment Type** TR  **Comment Status** A
In Fig 80-1 FEC sub-layer is noted as being "conditional", but it is actually conditional for the PHY type, but then optional.

**Suggested Remedy**
add second note that indicates that the FEC sub-layer is also optional. Apply to other layer diagrams throughout the document, where appropriate.

**Response**
REJECT.
This comment was WITHDRAWN by the commenter.

It is unclear that for physical instantiations XLAUI / CAUI that retiming is required and no apparent PIC for it.

**Suggested Remedy**
Presentation with proposed remedy to be provided.

**Response**
ACCEPT IN PRINCIPLE.
Charter the editors to remove references to CDRs in 83.5.1 and 83.5.4. Specify that a shall statement is included regarding the electrical requirements.

**Comment Type** TR  **Comment Status** A
The last sentence of the last paragraph contains a "shall" statement but there is no corresponding PICS

**Suggested Remedy**
Generate PIC statement

**Response**
REJECT.
This is an existing SHALL in unmodified text with an existing PICs.
use of "optical lanes" should clarify that optical lanes can either be via wavelengths or number of fibers
Suggested Remedy
modify sentence
The numeric suffix in the port type (e.g. 40GBASE-CR4 or 100GBASE-CR10) represents
the number of electrical or optical lanes.

The numeric suffix in the port type (e.g. 40GBASE-CR4 or 100GBASE-CR10) represents
the number of electrical or optical (i.e. number of wavelengths or optical fibers) lanes.
Response
ACCEPT IN PRINCIPLE.
Change sentence to:
The numeric suffix in the port type (e.g. 40GBASE-CR4 or 100GBASE-CR10) represents
the number of electrical or optical lanes (i.e. number of wavelengths or optical fibers).

The MII is scalable and capable of supporting speeds of operation above 10 Gb/s.
anything other than 40 Gb/s or 100 Gb/s is out of scope for the project
Suggested Remedy
wording
The XLGMII and CGMII (like the original MII, GMII and XGMII) maximize media
independence by cleanly separating the Data Link and Physical Layers of the OSI seven-
layer reference model.
Suggested Remedy
The XLGMII and CGMII maximize media independence by cleanly separating the Data
Link and Physical Layers of the OSI seven-layer reference model.
Response
ACCEPT.

The PMAs can support any of the respective PMDs
The 40GBASE-R PMA(s) can support one of the following PMDs: 40GBASE-SR4,
40GBASE-LR4, 40GBASE-CR4, or 40GBASE-KR4. The 100GBASE-R PMA(s) can support
one of the following PMDs: 100GBASE-SR10, 100GBASE-LR4, 100GBASE-ER4, or
100GBASE-CR10.
Suggested Remedy
change "one" to "any"
Response
ACCEPT.
Comment Type: T
Comment Status: A
the PMA adjacent to SP5 shall tolerate at least 3.6ns of Dynamic Skew seems incorrect, as the point was to limit dynamic skew to keep the channel to the same physical channel. The current wording does not put an upper bound on the amount of dynamic skew.

Suggested Remedy:
suggest rewording.

change "shall tolerate at least" to
"shall tolerate a maximum of"

This sentence is repeated throughout Clause 83, and suggested remedy should be used throughout it.

Response: ACCEPT.

Comment ID # 402

Comment Type: E
Comment Status: A
statement seems like a remnant from cut-n-paste

The 40GBASE-CR4 and 100GBASE-CR10 receiver shall be AC-coupled to the cable assembly to allow for maximum interoperability between various 10 Gb/s components.

Suggested Remedy:
change to

The 40GBASE-CR4 and 100GBASE-CR10 receiver shall be AC-coupled to the cable assembly to allow for maximum interoperability.

Response: ACCEPT.

Comment ID # 403

Comment Type: E
Comment Status: A
units should be metric

represents 8 inches (0.2032 m)

Suggested Remedy:
change to

represents approximately 0.20 m

Response: ACCEPT IN PRINCIPLE.

Change to "represents approximately 0.20 meters (8 inches)"

Comment ID # 404

Comment Type: E
Comment Status: A
spelling error - receivr

Suggested Remedy:
change to receiver

Response: ACCEPT.
Comment Type: T  Comment Status: A  Lanes
subclauses for optical lane assignments for 40 & 100G SR are blank.

Suggested Remedy
- delete if no presentations are provided.

Response  Response Status: C
ACCEPT IN PRINCIPLE.
Subclauses 86.5.1 and 86.5.2 have been populated. See Responses to comments 186 and 187.

Comment ID # 409

Comment ID # 409

Comment Type: TR  Comment Status: A
The Statistical Eye Ad hoc has not met in several months and is not providing any feedback into the task force.

[Editor's note (to be removed prior to publication) - Details of the transmit eye mask measurement are being studied by the Statistical Eye Ad Hoc and consequently the contents of clause 88.9.8 together with the mask parameters in Tables 88-7 and 88-11 are provisional.]

Suggested Remedy
- delete editor's notes related to Statistical Eye Ad Hoc throughout the document

Response  Response Status: C
ACCEPT.

See also comments 257 and 567

Comment ID # 409

Comment ID # 409

Comment Type: E  Comment Status: A
- typo - Returnloss

Suggested Remedy
- change to "Return Loss"

Response  Response Status: C
ACCEPT.

Comment ID # 409

Comment ID # 409

Comment Type: T  Comment Status: A
longer reaches for nAUI interconnects are possible via use of better board materials

Suggested Remedy
- change first paragraph on 362 to read

The XLAUI/CAUI is primarily intended as a point-to-point interface of up to approximately 25 cm between integrated circuits using controlled impedance traces on low-cost printed circuit boards (PCBs). Longer reaches for the XLAUI / CAUI may be achieved by the use of better PCB materials, as the performance of an actual XLAUI/CAUI interconnect is highly dependent on the implementation.

Response  Response Status: C
ACCEPT.
environmental specifications are missing.

SuggestedRemedy
   Copy environmental specifications from 84.10

83A.6.1 General safety
All equipment subject to this clause shall conform to applicable sections (including isolation requirements) of IEC 60950-1.

83A.6.2 Network safety
The designer is urged to consult the relevant local, national, and international safety regulations to ensure compliance with the appropriate requirements.

83A.6.3 Installation and maintenance guidelines
It is recommended that sound installation practice, as defined by applicable local codes and regulations, be followed in every instance in which such practice is applicable.

83A.6.4 Electromagnetic compatibility
A system integrating the 40GBASE-KR4 PHY shall comply with applicable local and national codes for the limitation of electromagnetic interference.

83A.6.5 Temperature and humidity
A system integrating the 40GBASE-KR4 PHY is expected to operate over a reasonable range of environmental conditions related to temperature, humidity, and physical handling (such as shock and vibration). Specific requirements and values for these parameters are considered to be beyond the scope of this standard.

Response
ACCEPT IN PRINCIPLE.
Modify "40GBASE-KR4 PHY" to XLAUI / CAUI

First instance of PCSL should define what the acronym means.

SuggestedRemedy
   replace "PCSL" with "PCS Lane"
   replace "PCS Lane (PCSL)" on Page 182, bullet A under 83.1.3

Response
ACCEPT.
<table>
<thead>
<tr>
<th>Comment ID #</th>
<th>413</th>
</tr>
</thead>
<tbody>
<tr>
<td>CI</td>
<td>85</td>
</tr>
<tr>
<td>SC</td>
<td>85.9.2</td>
</tr>
<tr>
<td>P</td>
<td>228</td>
</tr>
<tr>
<td>L</td>
<td>14</td>
</tr>
<tr>
<td>Comment Type</td>
<td>E</td>
</tr>
<tr>
<td>Comment Status</td>
<td>A</td>
</tr>
<tr>
<td>D'Ambrosia, John</td>
<td>Force10 Networks</td>
</tr>
<tr>
<td>Comment</td>
<td>font on fig 85-4 (and other channel related figures in clause 85) are very small and very difficult to read.</td>
</tr>
<tr>
<td>SuggestedRemedy</td>
<td>use larger font on figures</td>
</tr>
<tr>
<td>Response</td>
<td>ACCEPT IN PRINCIPLE</td>
</tr>
<tr>
<td>Response Status</td>
<td>C</td>
</tr>
<tr>
<td>Comment ID #</td>
<td>414</td>
</tr>
<tr>
<td>CI</td>
<td>83A</td>
</tr>
<tr>
<td>SC</td>
<td>83A.1</td>
</tr>
<tr>
<td>P</td>
<td>349</td>
</tr>
<tr>
<td>L</td>
<td>29</td>
</tr>
<tr>
<td>Comment Type</td>
<td>E</td>
</tr>
<tr>
<td>Comment Status</td>
<td>A</td>
</tr>
<tr>
<td>D'Ambrosia, John</td>
<td>Force10 Networks</td>
</tr>
<tr>
<td>Comment</td>
<td>XLAUI / CAUI are optional, but not noted that way in Fig 83A-1.1</td>
</tr>
<tr>
<td>SuggestedRemedy</td>
<td>note that xlaui / caui are optional in figure</td>
</tr>
<tr>
<td>Response</td>
<td>ACCEPT IN PRINCIPLE</td>
</tr>
<tr>
<td>Response Status</td>
<td>C</td>
</tr>
<tr>
<td>Comment ID #</td>
<td>415</td>
</tr>
<tr>
<td>CI</td>
<td>86</td>
</tr>
<tr>
<td>SC</td>
<td>86.6.2</td>
</tr>
<tr>
<td>P</td>
<td>257</td>
</tr>
<tr>
<td>L</td>
<td>43</td>
</tr>
<tr>
<td>Comment Type</td>
<td>T</td>
</tr>
<tr>
<td>Comment Status</td>
<td>A</td>
</tr>
<tr>
<td>Pettrilla, John</td>
<td>Avago Technologies</td>
</tr>
<tr>
<td>Comment</td>
<td>In table 86-8, parameters Max &amp; Min Average launch power and Aggregate signal parameter contain TBDs and/or are noted for further study.</td>
</tr>
<tr>
<td>SuggestedRemedy</td>
<td>Accept the changes in anslow_04_0109 for table 86-6.</td>
</tr>
<tr>
<td>Response</td>
<td>ACCEPT IN PRINCIPLE</td>
</tr>
<tr>
<td>Response Status</td>
<td>C</td>
</tr>
<tr>
<td>Comment ID #</td>
<td>416</td>
</tr>
<tr>
<td>CI</td>
<td>86</td>
</tr>
<tr>
<td>SC</td>
<td>86.6.4</td>
</tr>
<tr>
<td>P</td>
<td>259</td>
</tr>
<tr>
<td>L</td>
<td>15</td>
</tr>
<tr>
<td>Comment Type</td>
<td>T</td>
</tr>
<tr>
<td>Comment Status</td>
<td>A</td>
</tr>
<tr>
<td>Pettrilla, John</td>
<td>Avago Technologies</td>
</tr>
<tr>
<td>Comment</td>
<td>In table 86-10, the Stressed Rx sensitivity parameter and associated test conditions are TBD.</td>
</tr>
<tr>
<td>SuggestedRemedy</td>
<td>In table 86-10, change the Stressed Rx sensitivity parameter and associated test conditions from TBD as follows: Stressed Rx sensitivity to -5.4 Vertical eye closure penalty to 2.0 Stressed eye J2 jitter to 0.35 A presentation, pettrilla_01_0109, will be provided in support.</td>
</tr>
<tr>
<td>Response</td>
<td>ACCEPT IN PRINCIPLE</td>
</tr>
<tr>
<td>Response Status</td>
<td>C</td>
</tr>
<tr>
<td>Comment ID #</td>
<td>417</td>
</tr>
<tr>
<td>CI</td>
<td>86</td>
</tr>
<tr>
<td>SC</td>
<td>86.6.5</td>
</tr>
<tr>
<td>P</td>
<td>260</td>
</tr>
<tr>
<td>L</td>
<td>5</td>
</tr>
<tr>
<td>Comment Type</td>
<td>T</td>
</tr>
<tr>
<td>Comment Status</td>
<td>A</td>
</tr>
<tr>
<td>Pettrilla, John</td>
<td>Avago Technologies</td>
</tr>
<tr>
<td>Comment</td>
<td>In table 86-11, jitter parameters, TP4 TJ and DJ, are noted for further study.</td>
</tr>
<tr>
<td>SuggestedRemedy</td>
<td>Accept the changes in anslow_04_0109 for table 86-6. for table 86-11 jitter parameters.</td>
</tr>
<tr>
<td>Response</td>
<td>ACCEPT IN PRINCIPLE</td>
</tr>
<tr>
<td>Response Status</td>
<td>C</td>
</tr>
</tbody>
</table>

**TYPE:** TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general  
**COMMENT STATUS:** D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn  
**SORT ORDER:** Comment ID  
**Page 82 of 141**
In table 86-11, eye mask coordinate X1 = 0.35 is based on TJ. Anslow_04_0109 proposes shifting to a hit ratio of 1E-5 but doesn't take into account the reduced allocation at TP1.

The same issue holds for table 86-12.

**Suggested Remedy**

Accept the hit ratio, 1E-5, proposed in anslow_04_0109, but change X1 to 0.27.

**Repeat in table 86-12.**

**REJECT.**

This comment was WITHDRAWN by the commenter.

---

The parameter, RIN12OMA, was in lieu of or until an aggregate signal parameter was defined. TDP and OMA-TDP are now defined and RIN12OMA can be made informative or deleted.

**Suggested Remedy**

Delete subclause 86.7.5.6, if TDP or OMA-TDP is included.

**ACCEPT.**

Delete 86.7.5.6 entirely

---

TDP & OMA-TDP have been proposed in anslow_04_0109 as aggregate signal parameters. Unfortunately there seems to be a minor error in calculation of the bandwidth of the reference receiver/filter combination.

**Suggested Remedy**

Accept the changes to 86.7.5.4 in anslow_04_0109, except in item e, change 6.0 to 6.2.

**ACCEPT IN PRINCIPLE.**

After applying the changes in anslow_04_0109, in 86.7.5.4 item e, change 6.0 to 6.2.
Clause 86.7.3.1 only refers to 82.2.12 without defining measurement methods. Unfortunately, the definitions of clause 82.2.12 do not lend themselves to pragmatic test implementation as they refer to timing changes or differences over the extent of time the link is operational.

Suggested Remedy:
Accept the relevant change proposed in anslow_04_0109, except add appropriate time durations for these measurements, e.g. 24 hrs for dynamic skew & 7 days for total skew at SP1 and SP4 to capture effect of equipment power-up and daily cycles. Durations at SP2, SP3 and SP5 may be substantially shorter as only the PMA and PMD are involved.

Response: Accept in principle.
Change "Total Skew and Dynamic Skew are defined in 82.2.12" to "Skew and Skew Variation are defined in 82.2.12 and are required to remain within the limits given in 86.2.2 over the time that the link is in operation. Skew points as they relate to the PPI are shown in Figure 86-3."
Add additional text per response to comment 502 (anslow_04_0109.pdf). See comment 282 for change of skew terminology.

In table 86-6, parameters TP1a TJ, DJ & DDPW5, contain TBDs and/or are noted for further study. It appears the 0.30 UI Max for TP1a TJ is unnecessarily high and can be reduced to 0.26 UI. Further, the eye mask coordinate, X1 & X2 do not appear to be consistent with eye mask coordinates proposed for TP2 and/or the requirements of the receiver at TP3.

The same issue holds for table 86-7.

Suggested Remedy:
Accept the changes in anslow_04_0109 for table 86-6 except, change the Eye Mask Coordinates X1 & X2 to 0.10 & 0.25 respectively to account for the shifts in TJ from 0.30 UI to 0.26 UI, the shift from TJ to J9 and the shift to the hit ratio of 5E-5 as well as be consistent with eye mask coordinates at TP2 and optical receiver requirements.

Repeat for table 86-7.

Response: Accept in principle.
Change X1 & X2 from 0.12, 0.33 to 0.1, 0.31.

In table 86-8 the parameter RIN12OMA is noted for further study and becoming informative if its effects are included in an aggregate signal parameter. Such aggregate signal parameters, TDP & OMA-TDP, have been proposed. If TDP is accepted RIN12OMA can be noted as informative or deleted.

Suggested Remedy:
If TDP is accepted RIN12OMA, note as informative or delete.
Response: Accept in principle.
See Response to comment 608
Note other comments 558, 420 and 608 tagged "RIN".

In table 86-8 eye mask coordinates, X1, X2, X3, Y1, Y2, Y3, shown as 0.25, 0.4, 0.45, 0.25, 0.28, 0.4, respectively, are noted for further study. These values are just carried over from clause S2 and do not take into account the shift to a hit ratio of 5E-5 nor the requirements of the optical receiver for SRn. Further, since it has been shown, petrilla_03_1108, that a six-sided mask is sufficient, an eight-sided mask should be rejected due to the increase in test time or loss of yield due to the additional corners.

Suggested Remedy:
In table 86-8 change eye mask coordinates, X1, X2, X3, Y1, Y2, Y3, to 0.23, 0.34, 0.34, 0.17, 0.17, 0.4, respectively.

A presentation, petrilla_01_0109, will be provided in support.

Response: Accept in principle.
Change the eye mask coordinates from "0.25, 0.4, 0.45, 0.25, 0.28, 0.4" to "0.23, 0.34, 0.34, 0.17, 0.17, 0.4".
[Subclause changed from 86.2.2]
<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Suggested Remedy</th>
<th>Response</th>
<th>Response Status</th>
<th>Comment ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>86</td>
<td>86.7.3.2</td>
<td>264</td>
<td>40</td>
<td>TR</td>
<td>A</td>
<td>Clause 86.7.3.2, defining eye mask measurements, makes no mention of minimum test equipment requirements or de-embedding for the effects of the test equipment. To avoid over-rejection of otherwise acceptable product and for consistent results this should be explicitly addressed and applied consistently at the various interfaces. Since it is difficult to de-embed the test equipment from eye mask results, setting minimum test equipment requirement should be considered first.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Add a statement to 86.7.3.2 declaring that the equipment for measuring and displaying eye mask results meet minimum requirements for sensitivity (e.g. 3 dB better than the downstream receiver requirement), timing uncertainty (e.g. &lt; 300 fs), and bandwidth (e.g. 7.5 GHz for optical interfaces and 12 GHz for electrical interfaces). After the approach is decided, then all eye mask coordinates should be evaluated for fit with this approach.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>&quot;Consideration should be given as to whether a correction is needed for actual instrument properties.&quot;</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Suggested Remedy</th>
<th>Response</th>
<th>Response Status</th>
<th>Comment ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>86</td>
<td>86.7.3.1</td>
<td>262</td>
<td>44</td>
<td>T</td>
<td>A</td>
<td>lines 44-54 (total skew, dynamic skew for MM fibers)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Need to be sure MM definitions of skew are correct and correctly references in subclauses 80.4 and 82.2.12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>See Response to comment 502 [Editor's note: Commenter has not indicated the comment type. Assigned comment type as Technical]</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Suggested Remedy</th>
<th>Response</th>
<th>Response Status</th>
<th>Comment ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>80</td>
<td>80.4</td>
<td>120</td>
<td>1</td>
<td>ER</td>
<td>A</td>
<td>Skew</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Need to consolidate definitions of skew/dynamic skew so that they appear at earliest reference (here), that they agree for all PMD types. Also &quot;time that the link is operational&quot; needs to be defined -- is it only the length of time needed to measure BER = 10^-12 or something shorter or longer?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>a.move this text which is nomenclature definition to the front of subclause 80.4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>b.this line references a later clause 82.2.12. It is appropriate for the definition to appear in the first subclause it is used, hence move the 82.2.12 definition to this subclause.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>c.Note in subclause 86.7.3.1 it is noted that the correct definition of skew and dynamic skew may need to be redefined differently for multimode fiber. This difference in definition should be noted in subclauses 80.4 and/or 82.2.12. There is a problem because 82.2.12 is primarily a definition appropriate to electronics.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>d.For completeness, the definition in 82.2.12 says the dynamic skew is defined as the change in total skew over the &quot;time that the link is operational&quot;. This &quot;operational time&quot; itself needs to be defined - is it only the length of time needed to measure BER = 10^-12 or something shorter or longer?</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Suggested remedy A, B, D are covered by the resolution of #431. For C, skew variation should not be defined differently because there are different contributors to the effect. If the commenter feels differently, additional justification is required.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Suggested Remedy</th>
<th>Response</th>
<th>Response Status</th>
<th>Comment ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>82</td>
<td>82.1.12</td>
<td>161</td>
<td>4</td>
<td>ER</td>
<td>A</td>
<td>(skew definition)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>ER</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>This definition (a) needs to be located in subclause 80.4 and (b) needs to be modified to include definitions for multimode and single mode fiber if necessary. For the definition of dynamic skew the definition of &quot;time that the link is operational&quot; needs to be more specific.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(skew definition)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(a) move to subclause 80.4 and refer to 80.4 at this point in text.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>(b) make sure definition is consistent for all link types.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>ACCEPT IN PRINCIPLE.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Move the definition as revised by #282 to 80.4 and refer to 80.4 in this subclause.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Comment ID # 432
Cl 86   SC 86.6.2   P 257   L 38   # 432
Abbott, John   Corning Incorporated

Comment Type: TR   Comment Status: R

Lines 38-41
Table 86-8. RMS spectral width. The RMS spectral width is not a good way to characterize the spectral content of VCSEL lasers, whose spectra consists of two or more narrow lines separated by a gap in wavelength. The RMS spectral width pre-supposes a Gaussian character to the spectral power vs. wavelength which is incorrect.

This change is needed in order to have an accurate link budget and for accurate link models.

A simple suggestion is to include both RMS width and full width quarter max.

Suggested Remedy
One solution is to include both RMS width and full width quarter max. Need to involve transceiver manufacturers

Response: C   Response Status: C

REJECT.

This comment was WITHDRAWN by the commenter.

Comment ID # 433
Cl 86   SC 86.6.6   P 261   L 10   # 433
Abbott, John   Corning Incorporated

Comment Type: TR   Comment Status: R

lines 10-37
Summarize link power budget and a link model in an informative annex with more detail. The link power budget in Table 86-13 should be incorporated into a link model spreadsheet similar to 10GEPBud3_1_16a.xls found at http://ieee802.org/3/ae/public/index.html (for 10GBASE).

However, the link model should be kept current with the 802.3ba project and summarized in annex 86A at the end of the project. Note that the spreadsheet 10GEPBud3_1_16a.xls does not accurately represent the 10GBASE link budget for all PMDs because it was a proposal early in the project. This has the potential to cause misunderstandings among users and also in subsequent standards.

Suggested Remedy
Summarize link power budget and a link model in an informative annex 86A with more detail.

Response: C   Response Status: C

REJECT. Standards don't have to show their working; an annex in the standard is not the right place for such material, and would not be convenient for a spreadsheet. 802.3ae partly moved away from the spreadsheet. Editor can respin 10GEPBud3_1_16a.xls with numbers from this project (for Clause 86, anyway) when they are stable enough and make it available but it may not be very helpful (jitter discussion...).
Comment Type: TR
Comment Status: R
Subclause 80.1.4 (Nomenclature) page 115 lines 22-25

For 10GBASE, the letters S and L represent the wavelength, with S being approximately 850nm and L being approximately 1300nm+. For example 10GBASE-LX4 and 10GBASE-LRM use 1310nm lasers, while 10GBASE-SR uses 850nm lasers over the same link distance as LX4.

Suggested Remedy
40Gb/s and 100Gb/s should retain the same terminology.
Alternatively, if the change in terminology is intentional, additional text should be added in this section clarifying that a change in terminology has been made to eliminate any misunderstanding.

Response: REJECT.
The nomenclature employed by the 40 and 100 Gigabit physical layers is defined in 80.1.4 since it is different from 10G.

Comment Type: E
Comment Status: A
Table 86-16
Some CDRs will not support a square wave test pattern because the transition density is too low for clock rate acquisition. An equivalent measurement can be made using PRBS9 (pattern 4).

Suggested Remedy
Add "or 4" after Square on lines 9, 20, 31 in table 86-16.
Add "or 68.6.2" to the 'Related subclause' column on lines 9, 20.

Response: ACCEPT IN PRINCIPLE.
See response to comment 566. See also comments 206, 464, 635.
Some CDRs will not support a square wave test pattern because the transition density is too low for clock rate acquisition. An equivalent measurement can be made using PRBS9 (pattern 4).

**Suggested Remedy**

Add "or 4" after Square on line 11 in table 87-11 and add "or 68.6.2" after "87.8.5" in the 'related subclause' column

**Response**

ACCEPT IN PRINCIPLE.

In the row for Pattern 4 in Table 87-10, change "TBD" to "PRBS9"
In the row for "Optical modulation amplitude (OMA)" in Table 87-11, change "Square" to "Square, 4", the "Related subclause" entry to remain as it is.

In clause 87.8.5 change "OMA is as defined in 52.9.5 with the exception that..." to "OMA is as defined in 52.9.5 for measurement with a square (8 ones, 8 zeros) test pattern or 68.6.2 (from the variable MeasuredOMA in 68.6.6.2) for measurement with a PRBS9 test pattern with the exception that...". 
IEEE P802.3ba D1.1 40Gb/s and 100Gb/s Ethernet comments

Draft 1.1 Comments

Response

Cl 87  SC 87.8.5  P 293  L 43  # 441
king, jonathan  finisar

Comment Type  T  Comment Status  A
OMA measurement is defined in 52. for a square wave.
Definition of a test method using PRBS9 is needed.

SuggestedRemedy
After "is as defined in 52.9.5" insert "or 68.6.2"

Response  Response Status  C
ACCEPT IN PRINCIPLE.
See response to comment 438

Cl 82  SC 82.2.8  P 158  L 12  # 442
Lee, Kyusang  ICU

Comment Type  T  Comment Status  A
Actually figure 82-7 and 82-8 shows n lanes.

SuggestedRemedy
Lane start with Lane0 and finish Lane n. The number of Lane is n+1. Lane n should be (n-1) Lane n-1

Response  Response Status  C
ACCEPT IN PRINCIPLE.

Cl 82  SC 82.2.7  P 157  L 34  # 443
Lee, Kyusang  ICU

Comment Type  E  Comment Status  A
PCS distributes the 66-bit block to n lanes. Actually figure 82-6 shows (n+1) distributions.

SuggestedRemedy
66b Block distribution should end with '66b Block n-1', '66b Block 2(n-1)', and etc. Or, First
66b Block distribution should start with 66b Block 1, 66b Block n+2, and etc.

Response  Response Status  C
ACCEPT.
Change numbering to 0 to n-1 in figure 82-6.

Cl 73  SC 73.7.4.1  P 96  L 40  # 444
Valliappan, Magesh  Broadcom

Comment Type  T  Comment Status  A
Draft says "Parallel Detection is not performed for 10GBASE-KR"

SuggestedRemedy
Similarly, parallel detection can not be performed for 40GBase-CR4/KR4 and 100GBase-CR10. Specify those PMDs as well

SuggestedRemedy
Change to "Parallel Detection is not performed for 10GBASE-KR, 40GBase-CR4, 40GBase-KR4 and 100GBase-CR10."

Response  Response Status  C
ACCEPT.

Cl 80  SC 80.4  P 121  L 10  # 445
Dudek, Mike  JDSU

Comment Type  TR  Comment Status  A
Skew
There is insufficient skew allowed for some desirable implementations between SP2 and SP3, and between SP4 and SP5 for the WDM mux/demuxes. There is more than enough skew allocated for the transmission medium

SuggestedRemedy
Change SP3 Total skew to 54ns (558 UI for 40G, and 279 UI for 100G) and SP4 skew to 134ns (1380 UI for 40G and 690 UI for 100G). in table 80-3

Also in clause 83 section 83.5.3.5 page 190 line 53 change 144ns to 134ns

Response  Response Status  C
ACCEPT IN PRINCIPLE.
See response for #280.
Comment Type: T  Comment Status: A
We should use PRBS9
Suggested Remedy
Replace "TBD short pattern" with "PRBS9" 4 places.
Response  Response Status: C
ACCEPT.

Comment Type: TR  Comment Status: A
The most useful short pattern is the PRBS9, the same as the pattern used in Clause 68.
This is needed for measuring DDPWS as used in Clause 86
Suggested Remedy
Change TBD to PRBS9 18 places. Remove if PRBS9
Response  Response Status: C
ACCEPT.

Comment Type: TR  Comment Status: A
We do need to be able to generate square wave pattern on one lane and typical data on
the other lanes to measure RIN or QSO with crosstalk effects included. There is no need to
generate the square wave pattern on all lanes at the same time.
Suggested Remedy
At this sentence change "on each of the lanes" to "on the specified lane". Add per lane
enabling of the square wave pattern, here and in clause 45. Note that if the PMA is set to
transmit PRBS31 and any lanes are set to transmit square wave, then the square wave will
be transmitted on those lanes and all other lanes will transmit PRBS31.
Response  Response Status: C
ACCEPT IN PRINCIPLE.
See response to comment #657.
Some of the specifications (return losses) in table 86-7 apply at TP1 while others apply at TP1a.

In the table title change "TP1a" to "TP1 and TP1a", or better split the table and references to it, into two tables

- "PPI electrical transmit signal input specifications at TP1" with the SDD11 and SCD11 specifications
- "PPI electrical transmit signal input tolerance at TP1a" with all the other specifications.

Note this change is also needed in Anslow_04

---

TDP is the best aggregate signal metric for this system. It also enables a trade off between minimum OMA and signal impairments.

- In table 86-8 Replate Aggregate signal parameter tbd with Transmission and Dispersion Penalty (TDP) max value of 4dB.
- Add a row "Optical Modulation Amplitude (OMA) minus TDP" min -7dBm.
- Replace the TBD for Average launch power in with -8dBm.

Note that this is as proposed in Anslow_04

---

The maximum OMA and the Peak Power from the transmitter should be specified. The values suggested assume that at the maximum average power the extinction ratio is <=9.4dB and at this extinction ratio the overshoot is <13%.

If the average power is not at its max value then the extinction ratio can be higher and/or the overshoot can be larger. Similarly if the average power is at the maximum value but the extinction ratio is less than the overshoot can be larger.

It is expected that the vast majority of transmitters would be compliant to these requirements anyway.

---

Also make equivalent changes to table 86-9

Note that these are the proposed changes in Anslow_04

---

Note that these are the proposed changes in Anslow_04

---

Also make equivalent changes to Table 86-10 (receiver specs) page 259 for Optical Modulation Amplitude max +3dBm and Peak Power max +4dBm. (These changes are not in Anslow_04)

Note that these are the proposed changes in Anslow_04

---

Also (not in Anslow_04) in table 86-16 page 264 change Aggregate TP2 metric to TDP.
### Comment 454

**Comment Type:** TR  
**Comment Status:** A  

Specifying the stressed receiver input signal as having minimal random jitter and noise for 10G was a bad idea as this was too difficult for test equipment vendors to produce resulting in over-stressful tests, also it is better to test with a signal that more accurately represents a worst case input signal.

**Suggested Remedy:**
- Add a row to table 86-10. stressed eye J9 jitter. Value TBD  
- Also include a definition of J9 jitter in the test section.

**Response:**
- Response Status: C  
- ACCEPT IN PRINCIPLE.  
- See Response to comment 502

### Comment 455

**Comment Type:** T  
**Comment Status:** A  

Eye mask tests are best specified at a reasonable hit rate to provide statistical significance in a reasonable test time.  5e-5 is an appropriate hit ratio. with this hit ratio and to reduce the stress on the electrical receiver the value of X1 should be reduced.

**Suggested Remedy:**
- In Tables 86-11 and 86-12
  - Change X1 value to 0.29 and add "Hit Ratio = 5x10^-5 to the conditions for both tables.

**Response:**
- Response Status: C  
- ACCEPT IN PRINCIPLE.  
- See Response to comment 502

### Comment 457

**Comment Type:** T  
**Comment Status:** A  

Some of the specifications (jitter and eye mask) in Table 86-12 should be calibrated after the connector while others (reflection coefficients) are tested before the connector.

**Suggested Remedy:**
- Either change the title to "TP4 and TP4a" and add "at TP4* to the jitter and eye mask rows and "at TP4a* to the other rows or better split the table moving the jitter and eye mask rows into a new table labelled "PPI receiver electrical input tolerance specifications at TP4".

**Response:**
- Response Status: C  
- ACCEPT IN PRINCIPLE.  
- Change table title to "PPI receiver electrical input specifications at TP4 and TP4a"  
- Editor to see if adding a column is practical, if not add "at TP4a* to S-parameters.  
- Also, add AC common mode input voltage tolerance (RMS) min to Table 86-12 with a value of 7.5 mV
**Comment #458**

**Comment Type:** E  
**Comment Status:** A  
**Suggested Remedy:** Delete one

**Response**  
**Response Status:** C  
**Accept in Principle.**  
Deleted by 560.

---

**Comment #459**

**Comment Type:** T  
**Comment Status:** A  
**Suggested Remedy:** Add "for max TDP" to the Power budget and allocation for penalties rows.

**Response**  
**Response Status:** C  
**Accept in Principle.**  
See response to comment 502.

**Comment #460**

**Comment Type:** T  
**Comment Status:** A  
**Suggested Remedy:** Either delete pattern no 5 or add PCS between Gb/s and pseudo

**Response**  
**Response Status:** C  
**Accept in Principle.**  
See response to comment 505.  
See also comments 562, 473, 563, 564, 205, 463, 460, 634, 565, 332.
Comment Type: Technical  Comment Status: Accepted  Patterns
We should use the PRBS9 pattern as the short pattern.

Suggested Remedy:
We should use the PRBS9 pattern as the short pattern.

Response: 
ACCEP IN PRINCIPLE.
See response to comment 505.
See also comments 562, 473, 564, 205, 460, 634, 462, 565, 332.

Comment Type: Technical  Comment Status: Accepted  Patterns
footnote b isn't helpful. Using a portion of a 40Gbase-R4 signal to measure spectral width isn't easy.

Suggested Remedy:
Delete footnote b

Response: 
ACCEP IN PRINCIPLE.
See response to comment 566.
See also comments 206, 437, 635.

Comment Type: Technical  Comment Status: Accepted  Patterns
We do not need an additional TBD test signal.

Suggested Remedy:
delete "or with other patterns, such as TBD signal"

Response: 
ACCEP IN PRINCIPLE.
See response to comment 240.
See also comments 207 and 225.
See also comments 505, 562, 473, 563, 460.
[Editor's note: Commenter has not indicated the comment type. Assigned comment type as Technical. Subclause changed from 86.6.5.7.]
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
<th>Type: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn SORT ORDER: Comment ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>469</td>
<td>T</td>
<td>A</td>
<td>86</td>
<td>86.7.5.9</td>
<td>269</td>
<td>48</td>
<td></td>
<td>PRBS31 is a good pattern for stressed sensitivityyw ever the editor's note is technically incorrect and should be deleted. The correct note would have stated that fibers manufactured to the old specification in practice actually meet the new tighter specification.</td>
</tr>
<tr>
<td>469</td>
<td>T</td>
<td>A</td>
<td>86</td>
<td>86.10.1</td>
<td>272</td>
<td>20</td>
<td></td>
<td>100ns of skew is much more than is needed. A separate comment has been made to re-allocate 20ns of this skew to the PMD's.</td>
</tr>
<tr>
<td>470</td>
<td>TR</td>
<td>A</td>
<td>83</td>
<td>83.5.9</td>
<td>192</td>
<td>50</td>
<td></td>
<td>Add at the end of the paragraph. There shall be at least 31 bits delay between the PRBS31 patterns generated on one lane and any other lane.</td>
</tr>
<tr>
<td>471</td>
<td>T</td>
<td>A</td>
<td>86</td>
<td>86.10.2.1</td>
<td>273</td>
<td>18</td>
<td></td>
<td>Test pattern 2 in clause 52 was generated to stress CDR circuits. It includes pattern transitions that are considered likely to be more stressful than PRBS31. There is no provision in the PMA to generate a pattern like this. Is it necessary?</td>
</tr>
<tr>
<td>472</td>
<td>T</td>
<td>A</td>
<td>86</td>
<td>86.7.2</td>
<td>263</td>
<td>32</td>
<td></td>
<td>A separate comment changes the skew value in Table 80-3. If that is accepted the skew values on lines 25 and 28 should change</td>
</tr>
</tbody>
</table>

Dudek, Mike JDSU

470: **Response**

Accept.

471: **Response**

Accept in principle.

472: **Response**

Delete the editor's note.

473: **Response**

Accept in principle.

474: **Response**

Accept in principle. See response to comment 280.
Comment Type: T  Comment Status: A
Of the available patterns PRBS31 or valid 40GBASE-LR Signal is appropriate for all the tests that have TBD except Calibration of OMA which should be square.

However Clause 52 deemed it necessary to create a more stressful pattern than PRBS31 for testing CDR's.

Suggested Remedy
Make this change
Consider however whether a pattern such as pattern 2 in clause 52 should be used for stressed receiver sensitivity testing.

Response  Response Status: C
ACCEPT IN PRINCIPLE.
See Response to comment 223
See also comments 562 and 563

Comment Type: TR  Comment Status: A
Crosstalk within the PMD Tx needs to be part of this test.

Suggested Remedy
Add. The lanes not under test shall be operating with PRBS31 or valid 64/66B data.

Response  Response Status: C
ACCEPT IN PRINCIPLE.
Add. The lanes not under test shall be operating with PRBS31 or valid 40GBASE-LR4 bit streams.

Comment Type: T  Comment Status: A
There are TBD's for the reference Tx rise/fall time and RIN. The exact values are not critical as their effect is to be calibrated out of the measurement, however they are specified so that the correction factor is not large (as its calculation may not be that accurate)

Suggested Remedy
use 25ps for the rise/fall times and 135dB/Hz for RIN.

Response  Response Status: C
ACCEPT IN PRINCIPLE.
See response to comment 224

Comment Type: T  Comment Status: A
PRBS31 is a suitable pattern for the lanes not under test.

Suggested Remedy
Replace TBD with PRBS31.

Response  Response Status: C
ACCEPT IN PRINCIPLE.
See response to comment 228

Comment Type: T  Comment Status: A
A separate comment changes the skew value in Table 80-3. If that is accepted the skew values on lines 25 and 28 should change

Suggested Remedy
SP3 skew changes from 44ns to 54ns and SP4 skew changes from 144ns to 134ns.

Response  Response Status: C
ACCEPT IN PRINCIPLE.
[Editor's note: Missing comment type set to T]
See Response to comment 290.
See also comments 445, 471 and 474
IEEE P802.3ba D1.1 40Gb/s and 100Gb/s Ethernet comments

Task force Review

XLAUI/CAUI is the physical instantiation of the PMA to PMA interface. For correct operation XLAUI/CAUI requires the CDR of the PMA and the scrambling, and MLD coding of the PCS it therefore cannot be used for chip to chip communication other than from PMA to PMA.

Suggested Remedy
Delete bullet a).

ACCEPT IN PRINCIPLE.

Suggested remedy replace bullet a) D1.1 with
a) The optional XLAUI/CAUI interface can be inserted between PMA layers in the IEEE 802.3 CSMA/CD LAN model to transparently enable chip-to-chip communication;

The specifications in this clause are for a transmitter without pre-emphasis (low Tx jitter) and a receiver with equalization (separate spec for non-equalizable jitter). It is intended that this transmitter will have pre-emphasis and the receiver will not require equalization. A transmitter with pre-emphasis is unlikely to meet these specs. Note it is unacceptable in a standard to say measure with pre-emphasis turned off and then turn on pre-emphasis with an assumption that this doesn't degrade the effective jitter as a solution to this.

Suggested Remedy
Either
A. Specify the Tx output with low present jitter and eye mask specs at the output of a specified compliance channel of intermediate length, such that shorter and longer channels will achieve the Rx input jitter and eye mask specs.
B. Specify the Tx output with the same jitter and eye mask as the Rx input at both the Tx (no trace length) and at the end of a worst case specified compliance channel.
C. Specify the Tx output with a pulse mask. However this is likely to be difficult to control jitter without being very restrictive.

REJECT. Lower jitter values are acceptable as an XLAUI / CAUI input.
In order to not require the receiver to tolerate an OMA of 5.3dBm and a peak power of 6.7dBm the max OMA and max peak power should be restricted, particularly as it is unlikely that a transmitter will be operating simultaneously with max average power, max extinction ratio and max overshoot. The suggested values are equivalent at max average power to an ER of <= 6.8dB and an overshoot of 25%.

**Suggested Remedy**

Add extra rows to tables 87-7 and 87-8.
- **Optical Modulation Amplitude (OMA) each lane (max)** 3.5dBm
- **Peak Power per lane (max)** 5.3dBm

**Response**

ACCEPT IN PRINCIPLE.

In Table 87-7 add rows:
"Optical Modulation Amplitude (OMA), each lane (max)" with a value of 3.5 dBm

In Table 87-8 add rows:
"Receive power, each lane (OMA) (max)" with a value of 3.5 dBm

Do not add the peak power requirement

---

With the specification of OMA minus TDP there is little downside to allowing a larger value of TDP.

10Gbase-LR allowed 3.2dB and didn't have potential crosstalk issues, however such a large value is unlikely to be needed with present technology. The only consequent change would be to increase the stressed sensitivity and vertical eye closure penalty for testing the Rx.

**Suggested Remedy**

In table 87-7
Change TDP max to 2.8dB

In table 87-8 change stressed sensitivity to max to -9.4 and increase the vertical eye closure penalty to 2.1 dB.

**Response**

REJECT.

Requires further discussion commenter is invited to resubmit on future draft
**With the specification of OMA minus TDP there is no need to have a tight specification on RIN or such a tight specification on TDP. Relaxations in these values allow implementers more possible trade-offs without degrading the link budget. There is no drawback to increasing RIN max. The only drawback to increasing the maximum value of TDP is that the receiver needs to be tested with somewhat larger VECP, but at a higher power.**

**Note that the LR TDP max was 3.2dB.**

**Suggested Remedy**
- In table 88-7: Increase RIN specification to -130dB/Hz. Increase TDP max to 2.8dB.
- In table 88-8: Increase stressed receiver sensitivity to -6.2dBm. Increase VECP to 2.4dB.
- In table 88-9: Increase power budget to 9.1, increase the allocation for penalties to 2.8dB. Also add a footnote to these rows. Footnote to say "The link power budget is with the maximum TDP allowed."

Delete the editors notes related to TDP value.

**Response: Accept in Principle.**

In table 88-7: Increase RIN specification to -130dB/Hz. Set TDP max to 2.2dB. Delete editors note.

Make no changes to Table 88-8.

The TDP max value requires further discussion commenter is invited to resubmit on future draft.

In Table 88-9 only change "Power budget" to "Power budget (for max TDP)" and "Allocation for penalties" to "Allocation for penalties (for max TDP)"

See also comment 232.

---

**Restricting the transmitter to a maximum OMA of only 4.0dBm when the receiver is specified to receive 4.5dBm OMA is unnecessary. It also seems surprising that the OMA max for the 40km part is less than for the 10km part. The same arguments hold for the maximum average power however there is no point in increasing this beyond 2.9dBm as the minimum ER allowed is 8dB.**

**Suggested Remedy**
- In table 88-11: change the maximum OMA from 4.0dBm to 4.5dBm. Change the maximum average power from 2.4dB to 2.9dBm.

**Response: Accept in Principle.**

In table 88-11: change the maximum OMA from 4.0dBm to 4.5dBm. Change the maximum average power from 2.4dB to 2.9dBm. Change the Total average launch power (max) from 8.4dBm to 8.9dBm.
Comment Type: TR
Comment Status: A

There is no specification that requires good transmitter signal quality other than the eye diagram which is not a good predictor of system performance, also there is no restriction on chirp. By adding the TDP specification and using OMA minus TDP as the key specification metric (like LR4) the chirp specification hole is filled and trade-offs are allowed that don't impact the system budget but make it easier to make transmitters.

It is also then unnecessary to have such a tight RIN spec.

Suggested Remedy:

- In Table 88-11:
  - Insert row Transmitter and Dispersion Penalty (max) 3.5dB.
  - Insert row Optical Modulation Amplitude minus TDP each lane (min) -3.4dBm
  - Row Average launch power per lane min from -2.9dBm to -5.4dBm.
  - Rin change from -132dB/Hz to -130dB/Hz.

- In Table 88-13:
  - Add footnote to the power budget and allocation for penalties. Footnote to say "This link budget is with the maximum TDP allowed".

Response: C

ACCEPT IN PRINCIPLE.

In Table 88-11 add a row for TDP with a value of 2.5 dB Change the Rin to -130 dB/Hz Do not make the other proposed changes Modifying the budget to include OMA-TDP is considered high risk due to the combination of 25 Gbit/s lane rate and an SOA based receiver.

Comment Type: T
Comment Status: R

It is expected that external modulators with high extinction ratios could be used for this system and therefore specifying a minimum average power that is not equivalent to the minimum OMA at infinite extinction ratio is a significant restriction

Suggested Remedy:

- In Table 88-7 Change Average power per lane min from -4.3dBm to -5.3dBm.
- In Table 88-8 Change Average receive power per lane (min) from -10.6dBm to -11.6dBm.

Response: C

REJECT.

This comment was WITHDRAWN by the commenter.

The D 1.1 OMA per lane min is -1.3 dBm. At infinite extinction ratio this is -4.3 dBm

Comment Type: T
Comment Status: A

It would be good to explain the reason for the large maximum average receiver power

Suggested Remedy:

- In Table 88-12 Add a footnote to the Average receive power per lane (max). footnote to say "The Average receive power per lane (max) is larger than the transmitter value for compatibility with 100GBASE-LR4 units at short distances."

Response: C

ACCEPT IN PRINCIPLE.

In Table 88-12, add a footnote to the Average receive power, per lane (max) to say "The Average receive power per lane (max) is larger than the 100GBASE-ER4 transmitter value to allow compatibility with 100GBASE-LR4 units at short distances."
<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>86</td>
<td>86.6.1</td>
<td>256</td>
<td>1</td>
<td>494</td>
</tr>
<tr>
<td></td>
<td>Li, Mike Altera</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comment Type: TR  Comment Status: R

D1.0 jitter specifications in those tables were specified in terms of conventional TJ and DJ. However, in the D1.1 editor's notes, it is recorded that proposals were made to replace DJ with the so-called 99% jitter. 99% jitter is nothing but a TJ at higher probability (approx. 10^-4) that has a mixture of both Dj and RJ. In the case when the DJ pk-to-pk occurs at a smaller probability (e.g., 10^-8), 99% jitter will not be able to bound the DJ, and much larger DJ exists in the link can break the link.

**Suggested Remedy**

Keep the deterministic jitter since it has been used and worked well for many other standards (FC, GBE (e.g., 802.3ae, 802.3ap), PCI Express, CEI/OIF, SATA, etc.).

Response

REJECT.

[Editor's note: subclause was Tables 86-6, 86-7, 86-11, 86-12, line was 260 (a page number)]

The majority of the optical sub-task force believe that J2 and J9 are the preferred metrics for this application.

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>83A</td>
<td>83A.3.4.1</td>
<td>357</td>
<td>2633</td>
<td>495</td>
</tr>
<tr>
<td></td>
<td>Li, Mike Altera</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comment Type: TR  Comment Status: A

BER for XLAUI/CAUI is still not settled in D1.1. The current consensus is that the normative specification will be set at a BER=10^-12, while BER=10^4-15 will still be allowed for those who want to meet it. Current specification in D1.1 is thus considered to be for BER=10^-12, and specifications for 10^-15 are yet to be defined.

**Suggested Remedy**

Specification text for meeting BER=10^-15 for XLAUI/CAUI is needed.

Response

ACCEPT IN PRINCIPLE.

See comment resolution comment#58.

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>84</td>
<td>84.2.1.1</td>
<td>201</td>
<td>10</td>
<td>499</td>
</tr>
<tr>
<td></td>
<td>Anslow, Peter Nortel Networks</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comment Type: E  Comment Status: A

spurious space in "PMD_UNITDATA.request0 (tx_bit)" to "PMD_UNITDATA.request9 (tx_bit)" excluding "PMD_UNITDATA.request3(tx_bit)"

Also applies to 84.2.2

**Suggested Remedy**

Remove the space. ie change "PMD_UNITDATA.request0 (tx_bit)" to "PMD_UNITDATA.request0(tx_bit)" etc.

Do the equivalent in 84.2.2

Response

Response Status: C

ACCEPT.

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>84</td>
<td>84.2.1.4</td>
<td>201</td>
<td>29</td>
<td>500</td>
</tr>
<tr>
<td></td>
<td>Anslow, Peter Nortel Networks</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comment Type: E  Comment Status: A

84.2.1.4 PMD_UNITDATA.indication should be a heading 3 i.e. 84.2.2 and the next heading (currently 84.2.2) should be a heading 4 i.e. 84.2.2.1

**Suggested Remedy**

change the current 84.2.1.4 to heading 3 and change the current 84.2.2 to heading 4

Response

Response Status: C

ACCEPT.

also see comment 86
The draft is not consistent in its use of significant digits. For example, Table 86-11 has limits of 4.0 V and 5 %. Why not 4 V or 5.0 %?
The base standard is not consistent on this issue. Table 52.16 has "Transmitter and dispersion penalty (max)" of "3.0 dB" but, "Extinction ratio (min)" of "3 dB" It would be a good idea to decide on a format and use it consistently throughout the draft. Since the limits given do not have any associated tolerance, i.e. a. Max limit of 3 dB is the same as one of 3.0 dB where 2.999999 is compliant and 3.000001 is not, it is proposed to only use as many digits as is required to express the number.

**Suggested Remedy**

Throughout the draft, only use as many significant digits as is required to express the number. Values less than 1 are shown with a leading 0.

Valid examples are:
- 0.1 nm
- 3 dB
- 100 m

Invalid examples are:
- 0.10 nm
- 3.0 dB
- 100.0 m

**Response**

Accept in principle.
Implement as feasible in D1.2 for new clauses. Maintain consistency with prior content in existing clauses.

---

**Comment ID # 504**

Cl: 86 SC: 86 P: 247 L: 1

Anslow, Peter Nortel Networks

Comment Type: T  Comment Status: A

The editor's note says "The Dynamic Skew limit at SP2 may be too high, further information is invited. The limits may be different for 40G and 100G" However, the skew limit at SP2 is independent of the PMD type and hence it is inappropriate to have this note here.

**Suggested Remedy**

Remove editor's note

**Response**

Accept in principle.

Accept with any modifications as captured in other comment responses.
Table 86-15 lists pattern types that are appropriate for 10GBASE-R PHYs rather than 40/100GBASE-SR and is in a different format from Tables 87-10 and 88-14. Patterns 1 and 2 could never be seen in 40/100GBASE-SR and could only be generated by test gear. In this case there is a huge variety of test patterns that could be used. Why not add SONET/SDH or CEI test patterns? Also, it is poor practice to define the test pattern in two places. This is done in 83.5.9 with a reference to 49.2.8 for PRBS31, it should not be done again here. Why are there two square patterns?

Suggested Remedy
Replace Table 86-15 with the same table as 87-10

Response
ACCEPT IN PRINCIPLE.

Change Table 86-15 to become:

<table>
<thead>
<tr>
<th>Pattern</th>
<th>Pattern description</th>
<th>Defined in</th>
</tr>
</thead>
<tbody>
<tr>
<td>Square</td>
<td>Square (8 ones, 8 zeros)</td>
<td>83.5.9</td>
</tr>
<tr>
<td>3</td>
<td>PRBS31</td>
<td>83.5.9</td>
</tr>
<tr>
<td>4</td>
<td>PRBS9</td>
<td>83.5.9</td>
</tr>
<tr>
<td>5</td>
<td>Scrambled idle</td>
<td>82.2.10</td>
</tr>
</tbody>
</table>

This says "The effect of receipt of this primitive by the client (the PMA) is described in 83.3.1.3", however that clause describes receipt of data from the layer above the PMA.

Suggested Remedy
change to "The effect of receipt of this primitive by the client (the PMA) is described in 83.4"

Response
ACCEPT.

Add major options:
- 40G or 100G
- Number of lanes above this PMA (would be better done as a field to enter a number in like 'Date of Statement' on the previous page, rather than a yes/no multiple choice)
- Number of lanes below this PMA
- SP1SP6 needs to be split in two: nAUI above and nAUI below

Suggested Remedy
Add to PICS for lanes above and below and split SP1SP6 for XLAUI/CAUI above or below.

This says "Self-timed interface allows timing control at higher layers' mean?"
What does 'Shared functionality with other 40 Gb/s or 100 Gb/s ethernet blocks' mean? It looks like a copy from Clause 47. As nAUI doesn't do its own coding, I don't see what functional blocks are shared.

Suggested Remedy
Delete. If kept, correct 'ethernet' to 'Ethernet'.

ACCEPT IN PRINCIPLE.
Correct 'ethernet' to 'Ethernet'.

Comment Type: T  Comment Status: A
Response: Response Status: C

Response

For 40 Gb/s applications, the data stream is presented in four lanes as described in Clause 83, and for 100 Gb/s applications, it is presented in ten lanes.

Suggested Remedy
Change to 'For 40 Gb/s applications, the data stream is converted into four lanes at the chip interface' - not. The conversion is done well inside an IC, not necessarily the IC with the nAUI interface.

Suggested Remedy
Change to '83A.4.4' to a proper cross-reference to 86.7.4.3.

 ACCEPT IN PRINCIPLE.

Response: Response Status: C

See suggested remedy change converted to presented.
IEEE P802.3ba D1.1 40Gb/s and 100Gb/s Ethernet comments

Task force Review

Comment ID # 514

**Comment Type:** TR

**Comment Status:** R

**Suggested Remedy:**

Replace Maximum non-EQ Jitter (TJ - ISI) with a J2 spec. Refer to Clause 86 for definition.

**Response Status:** C

**Response:** REJECT.

See comment 255

---

Comment ID # 515

**Comment Type:** TR

**Comment Status:** R

**Suggested Remedy:**

Review.

**Response Status:** C

**Response:** REJECT.

Additional supporting material required with respect to this concern

---

Comment ID # 516

**Comment Type:** TR

**Comment Status:** A

**Suggested Remedy:**

Delete the editor's note.

**Response Status:** C

**Response:** ACCEPT IN PRINCIPLE.

See comment response #295

---

Comment ID # 517

**Comment Type:** TR

**Comment Status:** R

**Suggested Remedy:**

Show the connector. The transmit compliance points are looking upstream into the connector through a compliance board. The receive compliance points are looking upstream into the connector through a compliance board (for the compliance signal) and looking downstream into the connector through a compliance board (for S-parameters). If there is no connector, the implementer can slice the channel at a point of his choosing to create a point of observation. This might be at the same point in the channel for both directions but I don't think this is necessary. In other words, the implementer gets to choose the mix of transmit and receive emphasis when there is no connector.

**Response Status:** C

**Response:** REJECT. Values not provided for X2. Comment is insufficiently supported to make changes.

---

Comment ID # 518

**Comment Type:** TR

**Comment Status:** A

**Suggested Remedy:**

Reduce X2. Add a relative eye mask. Delete the editor's note.

**Response Status:** C

**Response:** REJECT. Values not provided for X2. Comment is insufficiently supported to make changes.

---

Comment ID # 519

**Comment Type:** E

**Comment Status:** A

**Suggested Remedy:**

Change 82.1.4 to 80.2.

**Response Status:** C

**Response:** ACCEPT.
There is a newer version of this page. Ask P802.3av for it.

The subclauses summarising the sublayers are nearly all in order, from top to bottom (the management interface is a special case) - except FEC.

Can you have a list with just one entry?

Wasted space. In general, figures and tables should float.

Comment Type E  Comment Status A  The subclauses summarising the sublayers are nearly all in order, from top to bottom (the management interface is a special case) - except FEC.

SuggestedRemedy
Move 80.2.3 Forward Error Correction (FEC) sublayer to after 80.2.2.1 Physical Coding Sublayer (PCS) and before 80.2.2.2 Physical Medium Attachment (PMA) sublayer.

Response  Response Status C  ACCEPT.

Can you have a list with just one entry?

SuggestedRemedy
Change to
In addition, the PMA provides receive link status information in the receive direction.

Response  Response Status C  ACCEPT.

Wasted space. In general, figures and tables should float.

SuggestedRemedy
Set Figure 83-1 to float, remove any blank line.

Response  Response Status C  ACCEPT.
Comment Type: E  Comment Status: A
Following D1.1 comment 335 through.

SuggestedRemedy
Change
PMA_UNITDATA.indication (rx_bit)
to
PMA_UNITDATA.indication (rx_bit)
i.e. without the space. Same in following subclauses e.g. 83.3.3.1.

Response
Response Status: C
ACCEPT.

Comment Type: E  Comment Status: A
Excessive cross-referencing. We have already told the reader at line 40 that test points are defined in 86.7.1.

SuggestedRemedy
Delete the second '(see 86.7.1)'

Response
Response Status: C
ACCEPT.

Comment Type: E  Comment Status: A
Three cross-references to 86.7.1 in four lines is excessive.

SuggestedRemedy
Delete '(see 86.7.1)' twice.

Response
Response Status: C
ACCEPT.

Comment Type: E  Comment Status: A
The distance between -Y3 and 0 should be the same as between 1 and 1+Y3.

SuggestedRemedy
Move the -Y3 section lower down.

Response
Response Status: C
ACCEPT IN PRINCIPLE.
Redrawn for changed eye coordinates.

Comment Type: E  Comment Status: A
There are no optical transmit jitter specs in this clause, although J2 and J9 are used for stressed receiver signal calibration.

SuggestedRemedy
Delete 86.7.5.8 Transmit jitter... and its Editor's note.

Response
Response Status: C
ACCEPT IN PRINCIPLE.
See Response to comment 502
**Comment #532**

**Comment Type:** E  
**Comment Status:** A  
**Suggested Remedy:**  
Correct the paragraph.

**Response:**  
ACCEPT IN PRINCIPLE.

Replace "When line loopback is enabled, each bit received over the PMD service interface via the x=0 to q-1." with "When line loopback is enabled, each bit received over a lane of the PMD service interface via PMD_UNITDATA.indicationx is looped back to the corresponding output lane via PMD_UNITDATA.requestx". Delete the sentence about PMAserver because it is only relevant when PMAserver=PMD.

Note that this was modified after the meeting to change PMD back to PMAserver since the text was softened by comment #624 that the remote loopback doesn't necessarily have to be in the lowest PMA, but low enough to guarantee the bit sequence of each looped back lane.

---

**Comment #533**

**Comment Type:** E  
**Comment Status:** A  
**Suggested Remedy:**  
this Clause (83.5.7).

**Response:**  
ACCEPT.

---

**Comment #534**

**Comment Type:** E  
**Comment Status:** A  
**Suggested Remedy:**  
Auto-Negotiation  
REJECT.

This text is taken directly from the IEEE 802.3 base document and so should not be changed without good reason.

**Response:**  
REJECT.

---

**Comment #535**

**Comment Type:** T  
**Comment Status:** R  
**Suggested Remedy:**  
Waste of space  
Change:  
LAN CSMA/CD LAYERS  
to: LAN CSMA/CD layers  
or better, LAN CSMA/CD layers  
or even better, Ethernet layers

**Response:**  
REJECT.

To preserve consistency with the base standard (e.g. Figure 52-1)
### Comment 537

**Comment Type:** T  
**Comment Status:** A  
**Suggested Remedy:** 
- Delete ‘MEDIUM:’
- ACCEPT.

**Response:** 
- Delete MEDIUM and change the abbreviations to SR, ER, etc...in respective layer diagrams [This comment applies to layer diagrams in all PMD clauses]

---

### Comment 538

**Comment Type:** T  
**Comment Status:** A  
**Suggested Remedy:** 
- Change
- Vertical eye closure penalty is a test condition for measuring stressed receiver sensitivity. It is not a required characteristic of the receiver.
- Stressed eye jitter is a test condition for measuring stressed receiver sensitivity. It is not a required characteristic of the receiver.
- Vertical eye closure penalty and stressed eye jitter are test conditions for measuring stressed receiver sensitivity. They are not characteristics of the receiver.

**Response:** 
- ACCEPT IN PRINCIPLE.

---

### Comment 539

**Comment Type:** T  
**Comment Status:** A  
**Suggested Remedy:** 
- Add rows for FEC and AN. If AN delay is counted as part of PMD delay, say so in a table note and give a cross-reference

**Response:** 
- ACCEPT IN PRINCIPLE.

---

### Comment 540

**Comment Type:** T  
**Comment Status:** R  
**Suggested Remedy:** 
- Turn note a into a NOTE (or regular text) at line 13, add extra sentence ‘One pause_quantum is 512 MAC bit times.’
- Either, if MAC and PCS engineers want their ‘bit time’ entries, insert a heading below the PCS in the second column ‘Maximum at nominal signaling rate (ns)’ and give the PMA and PMD entries in ns.
- Or, as MAC and PCS engineers can multiply by 512 and probably aren’t considering a serial MAC or PCS implementation anyway, replace the whole second column with ‘Maximum at nominal signaling rate (ns)’ and give all the entries in ns.

**Response:** 
- REJECT.

---

**Comment ID # 537**

**Comment ID # 538**

**Comment ID # 539**

**Comment ID # 540**

---

**TYPE:** TR/technical required  
**ER/editorial required:** G/general required  
**T/technical:**  
**E/editorial:**  
**G/general:**

**COMMENT STATUS:** D/dispatched  
**A/accepted:** R/rejected  
**RESPONSE STATUS:** O/open  
**W/written:** C/closed  
**U/unsatisfied:** Z/withdrawn

**SORT ORDER:** Comment ID  
**Page 109 of 141**  
**27/09/2009 12:56:20 PM**
Follow-up from D1.0 comment 322: need to determine whether the error bursting expected in 40GBASE-CR4 and 100GBASE-CR10 degrades MTTFPA too much.

Suggested Remedy
Do the analysis.
If it does, several options are available.

Comment Status: R
Response: C
Response Status: C

Suggested remedy is not complete

Comment 322 against D1.0 requested the ability to detect FEC errors without correcting them. For reference the final accepted response was:

“This needs approval by the task force.
Also the proposed remedy is not complete. MTTFPA, power, latency need to be analyzed before a change can be proposed.

Cannot use as background error monitor alone without adding latency because giving up sync header redundancy without being able to mark blocks bad due to FEC code will significantly increase MTTFPA.

Could affect PCS high BER and lock state machines if a single error multiplies to mark the entire block bad.”

Suggested Remedy
Move 80.2.2 to become 80.1.5.

Response: ACCEPT IN PRINCIPLE.

Move 80.2.2 to become 80.1.5 and renumber the subclauses 80.2.2.1 to become 80.2.1 and so on.
Comment Type: T  Comment Status: R  Lanes

Changes to the last draft made things worse; electrical lanes should not get a special mention when optical lanes are in the same situation. The empty 86.5.1 and 86.5.2 are unnecessary. Stop digging a hole. But it's worth pointing out that e.g. optical receive lane and signal detect lanes should correspond.

SuggestedRemedy

Change

There are no lane assignments for 40GBASE-SR4 and 100GBASE-SR10. While it is expected that a PMD will map electrical lane i to optical lane i and vice versa, there is no need to define where the electrical lanes are physically, as the PCS is capable of receiving the lanes in any arrangement.

to

A common lane numbering is used for optical transmitter and lane by lane transmit disable. A common lane numbering is used for optical receiver and lane by lane signal detect. As the PCS is capable of receiving the lanes in any arrangement, the PMD layer is not required to preserve lane numbering. This standard does not specify physical lane numbering at the PPI or MDI. A PMD may map electrical lane i to optical lane i and vice versa. MSA definitions of specific implementations of PPI or MDI, or connector specifications, distinguish transmit lanes from receive lanes.

Delete 86.5.1 and 86.5.2.

Response

REJECT.

This comment was WITHDRAWN by the commenter.

This comment was not necessary for technical completeness.

SuggestedRemedy

As far as I can see, all the specifications in Table 86-6 will be appropriate and applicable to the electrical transmit signal.

Delete 'appropriate', twice. Also in 86.6.5.

Response

ACCEPT.
Isn't it quite feasible to interoperate between a nAUI lane and an XFI spec part? Even to comply to both at once? Response to D1.1 comment 360 said 'Although this is feasible, there may be risks in explicitly stating it is interoperable with XFI. XFI loss budget including connector at 5.5GHz is 6dB. nAUI is looking at a 10dB budget.' This sounds like a yes.

Suggested Remedy
Say that this spec is similar to XFI (part of XFP), add informative reference for XFP document, state to what extent they are interoperable. Is it when the loss is 6 dB or less at 5.5 GHz?

Response
REJECT.
Comment and suggested remedy does not address the technical content of D1.1 open for comment.

If you have stated the signalling rate there is no need to give the unit interval, and writing down a recurring decimal is a nuisance. The other clauses don't have this.

Suggested Remedy
Delete the row 'Unit interval nominal 85.8.3.3 96.969697 ps'. In 85.8.3.3, delete 'The corresponding unit interval is nominally 96.969697 ps'. Similarly in 85.8.4 and 85.8.4.2.

Response
REJECT.
Other 802.3 clauses include UI. Providing UI and signalling speed in a look-up table of the Transmitter characteristics' summary helps users of the standards quickly view relevant transmitter parameters.

Figure 83A-8 Differential input return loss is the same as Figure 83A-4 Differential Output Returnloss. The file for D1.1 is already nearly as big as 802.3 Section 5 (3 projects, 19 clauses).

Suggested Remedy
Remove Figure 83A-8 and refer to Figure 83A-4. Change the title of Figure 83A-4 to Differential input or output return loss.

Response
REJECT.
Keeping input and output separate makes the document cleaner.

'non-EQ Jitter (TJ - ISI)'. There's no definition of what 'non-EQ Jitter' means in this document, nor this usage of 'ISI'. I suspect if I saw one I would not agree with it ;-)

Suggested Remedy
Find a better metric, or explain these terms.

Response
ACCEPT IN PRINCIPLE.
See comment 255
Comment Type: T  Comment Status: A  Skew

Figures 80-2 and 80-3 imply that the PMA next to the PMD is optional. Yet there must always be a PMA next to the PMD; one cannot connect to a PMD with nAUI.

Suggested Remedy
Mark the XLAUIs and CAUIs with 1 for optional.

Response
ACCEPT IN PRINCIPLE.

This is an example to illustrate the location of the skew points, and SP1/SP6 are only present when there is a XLAUI/CAUI. In this example, they are present (even though optional). Remove optional notes except for FEC. Remove back to back PMAs (10:10 and 10:4 in 100GBASE-R stack) in Figures 80-2, 80-3 and indicate single PMA(10:n) in lower PMA (n=4 or 10).

Add text to define locations of SPs, including clarification that SP6 is at the output of the uppermost XLAUI/CAUI and SP1 is at the output of the lowermost XLAUI/CAUI. This is illustrated by Figure 80-3 but never explained in the text.

Dawe, Piers
Avago Technologies

Comment Type: T  Comment Status: A  Filling the TBDs and other improvements.

Suggested Remedy
Accept the changes proposed in annex_04_0109 with exceptions as resolved.

Response
ACCEPT IN PRINCIPLE.
See Response to comment 502

Dawe, Piers
Avago Technologies

Comment Type: T  Comment Status: A  Illustrate the reflection specs.

Suggested Remedy
Show the reflection specs in a figure, delete [To do: illustrate these specs]

Response
ACCEPT.


Comment Type T  Comment Status A  RIN

Expecting that we will have a normative TDP spec per anslow_04_0109, we don't need a normative RIN spec. We are asked not to mix normative and informative material.

Suggested Remedy

Delete the RIN12OMA row in Table 86-9. Here, add 'The transmitter's RIN12OMA should not exceed -128 dB/Hz.'

Response  Response Status C

ACCEPT IN PRINCIPLE.

See Response to comment 608
Note other comments 420, 426 and 608 tagged "RIN".

Comment Type T  Comment Status R

Is this the best choice for AC blocking?

Suggested Remedy

Consider having the AC coupling in the host receiver rather than the PMD receive side. If not, Table 86-11 should say 'Single ended output voltage tolerance' and Table 86-12 should say 'Single ended output voltage'.

Response  Response Status C

REJECT. Commenter is invited to coordinate with Cu sub-task force participants and if appropriate, to re-submit against a future draft with all consequent changes e.g. output voltages and tolerances.

Comment Type T  Comment Status A

Pattern 1 is a suitable test pattern and it may be convenient for factories and others to use the same patterns for 10G, 40G and 100G production.

Suggested Remedy

Turn the row for Pattern 1 from italic to upright. Move or remove the footnote depending on decision for Pattern 2.

Response  Response Status C

ACCEPT IN PRINCIPLE.

See response to comment 505.
See also comments 473, 563, 564, 205, 463, 460, 634, 462, 565, 332.
Pattern 2 is as suitable for 40G and 100G as it is for 10G, and it may be convenient for factories and others to use the same patterns for 10G, 40G and 100G production.

**Suggested Remedy**

Turn the row for Pattern 2 from italic to upright. Remove footnote a.

**Response**

ACCEPT IN PRINCIPLE.

See response to comment 505.

See also comments 562, 473, 564, 332.

---

Adopt PRBS9.

**Suggested Remedy**

Change 'Short TBD' to 'PRBS9', change '[PRBS9 (if chosen) is defined in 68.6.1]' to '68.6.1' (upright text).

**Response**

ACCEPT IN PRINCIPLE.

See response to comment 505.

See also comments 562, 473, 564, 362, 565, 332.

---

The information about alternative square waves should not be in a normative table. One could move the information to the NOTE on the previous page, or...

**Suggested Remedy**

Delete the row 'Square'.

**Response**

ACCEPT IN PRINCIPLE.

See response to comment 505.

See also comments 562, 473, 564, 205, 463, 460, 634, 462, 565, 332.

---

Completing table of test patterns. Remove rows for TJ and DJ, add rows for J2 and J9.

Replace 'Aggregate TP2 metric' with 'TDP, OMA-TDP'. For rows that say '1 or 3' and for J2, allow Pattern 1, 2 or 3, the appropriate portion of a valid 40G/100G-SR-R10 signal (this includes Pattern 5), or a valid 10G-SR signal. For Tx eye, don't allow Pattern 2. For TDP, stressed sensitivity and J9, don't allow Pattern 1. For J9, don't allow Pattern 2 or PRBS9 (this last needs review). For DDPWS, PRBS9 only. For OMA and transition time, square 8+8 or PRBS9. Delete the RIN12OMA row as RIN12OMA should not be a normative spec and the test procedure in 52.9.6 is not appropriate for a system level test.

**Suggested Remedy**

See separate file to follow.

**Response**

ACCEPT IN PRINCIPLE.

In Table 86-16

Delete the row for RIN12OMA

Change "Aggregate TP2 metric" to "TDP"

Change "Total Jitter" to "J9 Jitter" and Related subclause from "86.7.4.4" to "86.7.3.3.2"

Change "Deterministic Jitter" to "J2 Jitter" and Related subclause from "86.7.4.4" to "86.7.3.3.1"

Set the Related subclause for DDPWS to "86.7.4.4.1"

In the Pattern column:

Set DDPWS to "4"

Set: Transmitter OMA (modulated optical power), Calibration of OMA for receiver tests and Transition time to "Square, 4"

Set: Wavelength, spectral width, Average optical power, Extinction ratio, Transmitted waveform (eye mask), J2 Jitter and AC common mode voltage to "3, 5, or valid 40/100G-SR signal"

Set TDP, Stressed receiver sensitivity, Vertical eye closure penalty calibration, J9 Jitter to "3, 5"

Delete all footnotes.

Also, in clause 86.7.5.3 change "OMA is as defined in 52.9.5 and 68.6.2." to "OMA is as defined in 52.9.5 for measurement with a square (8 ones, 8 zeros) test pattern or 68.6.2 (from the variable MeasuredOMA in 68.6.6.2) for measurement with a PRBS9 test pattern with the exception that each optical lane is tested individually."

Also, in clause 86.7.4.3 change "In this clause, transition times (rise and fall times) are defined as the time between the 20% and 80% times, or 80% and 20% times, respectively, of isolated edges. The normative test pattern is the square wave with eight ones and eight zeros."

Alternatively, suitable edges exist in the PRBS9, within sequences of five zeros and four ones.
ones, and nine ones and five zeros, respectively. These are bits 10 to 18 and 1 to 14, respectively. In this case, the 1% level and the 100% level may be estimated as ZeroLevel and ZeroLevel + MeasuredOMA in the TWDP code (see 68.6.6.2), or by the average signal within windows from -3 to -2 UI and from 2 to 3 UI relative to the edge. The alternative methods are inaccurate for transition times longer than 2.5 UI [TBC]." to
"In this clause, transition times (rise and fall times) are defined as the time between the 20% and 80% times, or 80% and 20% times, respectively, of isolated edges. This applies to electrical signals as well as optical signals.

If the test pattern is the square wave with eight ones and eight zeros, the 0% level and the 100% level are as defined by the OMA measurement procedure (see 68.6.2). If the test pattern is PRBS9, the transitions between sequences of five zeros and four ones, and nine ones and five zeros, respectively, are measured. These are bits 10 to 18 and 1 to 14, respectively. In this case, the 0% level and the 100% level may be estimated as ZeroLevel and ZeroLevel + MeasuredOMA in the TWDP code (see 68.6.6.2), or by the average signal within windows from -3 to -2 UI and from 2 to 3 UI relative to the edge."

After applying the changes in the response to comment 502:
In 86.7.3.2, add at the end "*The normative test patterns are given in Table 87-11. As Pattern 3 is more demanding than Pattern 5 (which itself is the same or more demanding than other 40GBASE-R or 100GBASE-R bit streams) an item which is compliant using Pattern 5 is considered compliant even if it does not meet the required limit using Pattern 3.*"

In 86.7.5.4 bullet c) add at the end "*As Pattern 3 is more demanding than Pattern 5 (which itself is the same or more demanding than other 40GBASE-R or 100GBASE-R bit streams) an item which is compliant using Pattern 5 is considered compliant even if it does not meet the required limit using Pattern 3.*"

See also comments 206, 437, 464, 635.

**SuggestedRemedy**

**Response**

**ACCEPT IN PRINCIPLE.**

**Comment**

**In eye mask testing, if use of CRU makes a difference we must specify whether it is used or not. If it doesn't make a difference, the test implementer can take short cuts whatever we say. We cannot fail a transmitter for wander that the receiver is specified to tolerate, or credit it for low jitter or noise that will be overwritten by any receiver that can tolerate the wander. Note Clauses 87 and 88 rely on this text.**

**SuggestedRemedy**

**Change**

A clock recovery unit (CRU) should be used to trigger the oscilloscope for mask measurements, as shown in Figure 52-9. It should have a high frequency corner bandwidth as specified in Table 86-17 and a slope of -20 dB/decade.

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

**Response**

**ACCEPT IN PRINCIPLE.**

**Comment**

**Having to use a pattern as unnatural as the 8+8 square wave is a pain, and is not necessary here.**

**SuggestedRemedy**

**Swap the normative and alternative procedures with editorial adjustments to make the text flow.**

**Response**

**ACCEPT IN PRINCIPLE.**

**Comment**

See response to comment 566
Cl 86 SC 86.7.4.3 P 266 L 27 # 570
Dawe, Piers Avago Technologies

Comment Type T Comment Status A
Unwanted question

SuggestedRemedy
Delete '[TBC]'.

Response Response Status C
ACCEPT IN PRINCIPLE.
See Response to comment 566

Cl 86 SC 86.7.4.5 P 267 L 11 # 571
Dawe, Piers Avago Technologies

Comment Type T Comment Status R
Depending on the outcome of another comment, there may be both absolute and relative electrical masks.

SuggestedRemedy
Revise 86.7.4.5 as appropriate.

Response Response Status C
REJECT.

This comment was WITHDRAWN by the commenter.

Cl 86 SC 86.7.4.7 P 267 L 20 # 572
Dawe, Piers Avago Technologies

Comment Type T Comment Status A
Any more electrical parameter definitions to be added?

SuggestedRemedy
Delete this heading or add them.

Response Response Status C
ACCEPT IN PRINCIPLE.
Delete the heading

Cl 86 SC 86.7.5.3 P 267 L 37 # 573
Dawe, Piers Avago Technologies

Comment Type T Comment Status A
The OMA definition is the only thing that causes us to need square wave generators. We need a measure with low experimental scatter for the clean reference signal in the TDP definition, and for the compliance signal in the stressed receiver sensitivity - both these (after averaging) are very 'linear' signals. We don't need such a good measure for the OMA of the product transmitter.

SuggestedRemedy
Look again at deriving OMA from a captured PRBS9 waveform. If this method is accurate enough (as it will be for the first two cases above), make it normative and delete the square wave generators in the PMA.

Response Response Status C
ACCEPT IN PRINCIPLE.

See Response to comment 505 for changes to Table 86-15 and comment 566 for changes to Table 86-16 and OMA measurement

Cl 86 SC 86.7.5.6 P 268 L 3 # 574
Dawe, Piers Avago Technologies

Comment Type T Comment Status A
RIN

Having to provide lane-by-lane square wave generators would be a nuisance, especially as RIN12OMA should be just informative.

SuggestedRemedy
Change subclause to:
The RIN measurement methodology of 52.9.6 may be used with these exceptions:

a) All lanes are operational in both directions (transmit and receive);
b) Each lane is tested individually;
c) The signal on the lanes not under test should be Pattern 1, 2, 3 (PRBS31), 5 or parts of valid 10GBASE-R, 40GBASE-R or 100GBASE-R signals;
d) It may be more convenient to find the equivalent of P_M with Pattern 1, 2, 3, 4, 5 or parts of valid 10GBASE-R, 40GBASE-R or 100GBASE-R signals and apply a correction factor.

Response Response Status C
ACCEPT IN PRINCIPLE.
See response to comment 422
With TDP, TDP-OMA and the eye mask in the draft we have adequate TP2 specs, although with more study, the mask could be better optimised.

Suggested Remedy
Delete the editor's note.

ACCEPT.

Are the 0 and 1 amplitudes or levels? Gratuitous capitals; Clause 45 doesn't use capitals.

Suggested Remedy
Change 'amplitudes' to 'levels', ZERO to zero, ONE to one.

ACCEPT IN PRINCIPLE.

In clause 86.7.5.9 change "using the method defined by 52.9.9 with the conformance test signal at TP3 with jitter J and vertical eye closure penalty as given in Table 86-10 and added sinusoidal jitter as specified in Table 86-17." to:

"using the method defined by 52.9.9 with the conformance test signal at TP3 and with the following exceptions:

a) The sinusoidal amplitude interferer is replaced by a Gaussian noise generator;

b) The sinusoidal jitter is at a fixed 80 MHz frequency;

c) The Gaussian noise generator, the amplitude of the sinusoidal jitter and the Bessel-Thomson filter are adjusted so that the VECP, J2 and J9 given in Table 86-10 are simultaneously met (the random noise effects such as RIN, random clock jitter do not need to be minimised).

Delete the second Table 86-17 (on page 269).
For the same reasons as for LRM, sinusoidal jitter tolerance testing should be separated.

Suggested Remedy

For the stressed receiver sensitivity, use just one SJ setting e.g. at 80 GHz.
Delete Table 86-17. Add rows to Table 86-8:

Conditions of receiver jitter tolerance test:
Jitter frequency and peak to peak amplitude (75, 5) (kHz, UI)
Jitter frequency and peak to peak amplitude (375, 1) (kHz, UI)

Add new subclause:
86.7.5.10 Receiver jitter tolerance
Receiver jitter tolerance for each lane is defined as in 68.6.11, with the following differences:

a) The pattern to be received is specified in Table 86-16;
b) The other receive lanes not being tested are receiving Pattern 1, 2, 3, 5, or portion(s) of a 10GBASE-R, 40GBASE-R4 or 100GBASE-R10 signal, and the transmitter is transmitting one of these signals using all lanes, and
c) The transmitter and the receiver are not synchronous.

Response

ACCEPT IN PRINCIPLE.
See Response to comment 578 for changes to clause 86.7.5.9

Add rows to Table 86-10:
Receiver jitter tolerance signal level in OMA, each lane with a value of -5.4 dBm
Conditions of receiver jitter tolerance test:
Jitter frequency and peak to peak amplitude (75, 5) (kHz, UI)
Jitter frequency and peak to peak amplitude (375, 1) (kHz, UI)

Add new subclause:
86.7.5.10 Receiver jitter tolerance
Receiver jitter tolerance for each lane is defined as in 68.6.11, with the following differences:

a) The pattern to be received is specified in Table 86-16;
b) The parameters of the signal are specified in Table 86-10;
c) The receive lanes not being tested are receiving Pattern 3, 5, or a valid 40GBASE-R4 or 100GBASE-R10 signal;
d) The transmitter is transmitting one of these signals using all lanes;
e) The transmitter and the receiver are not synchronous.

Response

ACCEPT IN PRINCIPLE.
The bits or patterns in these tests are not data.

Suggested Remedy

The data being transmitted is asynchronous to the received data.

Response

ACCEPT IN PRINCIPLE.
Change "The data being transmitted is asynchronous to the received data." to "The signal being transmitted is asynchronous to the received signal."
Comment Type T Comment Status A

Need to reduce cabling skew and Dynamic Skew limits by the skew and Dynamic Skew that could be caused by wavelength changes, which are attributable to the transmitter not the channel. We aren't required to spend all the skew budget.

SuggestedRemedy
Change Cabling skew Max from 100 to e.g. 99 ns. Change table title to:
Fiber optic cabling (channel) characteristics at 850 nm.
Change footnote b to:
These channel insertion loss values include cable, connectors, and splices.

Response Response Status C
ACCEPT IN PRINCIPLE.
Change table title to:
Fiber optic cabling (channel) characteristics at 850 nm.
Change footnote b to:
These channel insertion loss values include cable, connectors, and splices.
Change Cabling skew Max from 100 to 79 ns

---

Comment Type T Comment Status A

Is the channel insertion loss going to receive further study?

SuggestedRemedy
Review the 1.9 dB allocation and delete footnote c.

Response Response Status C
ACCEPT.

---

Comment Type T Comment Status A

There is only one sort of maximum link distance, and only one maximum link distance, in this clause. 'calculated based on' seems like a mistake.

SuggestedRemedy
Change 'The maximum link distances for multimode fiber are calculated based on' to 'The maximum link distance is based on'.

Response Response Status C
ACCEPT.
As n is 3 or 9, there are not n optical signal streams.

Suggested Remedy
Change 'n' to '4 or 10'.

Response
ACCEPT.

Bit 1.19.15 cannot always be 1. MMDs are expected to return zero for addresses they don't use - and e.g. 10G MMDs don't use this address. In other words, the register is implemented even if the feature isn't.

Suggested Remedy
Change table entry and text to the usual 1 for able, 0 for not able.

Response
ACCEPT.

Having the PMA system loopback at the top of the PMA stack (i.e. inside the same chip as the PCS) means that doesn't test most of the PMA, and is not the way loopback is usually done. For example, 51.8 says NOTE-Loopback mode may be implemented either in the parallel or the serial circuitry of a device. and 50.3.9 says NOTE-The signal path through the WIS that is exercised in the Loopback mode of operation is implementation specific, but it is recommended that this signal path encompass as much of the WIS circuitry as is practical.

Three uses of system loopback - exercising the sublayers above, verifying correct operation of most of the PMA, and identifying a faulty part are achieved by this. If sometimes the lanes are re-ordered, so much the better for exercising the sublayers above. Diagnosing one bad lane is a specialist situation that this loopback need not cover - the lane by lane pattern checkers may be useful for this (although not in D1.1 where the checkers are below the loopback point).

The system loopback should be in the lowest PMA above any connector.

Suggested Remedy
Change
At the PMA service interface, the uppermost PMA sublayer (the one closest to the PCS) may provide a system loopback function. The function involves looping back each input lane to the corresponding output lane. Each bit received from the PMA_UNIDATA.requestx(rx_bit) primitive is looped back in the direction of the PCS using the PMA_UNIDATA.indicationx(rx_bit) primitive.

to
The PMA sublayer directly above the higher of any demountable electrical connectors between sublayers (if there is no such connector, the lowest PMA) may provide a system loopback function. The function involves looping back each input lane to an output lane. NOTE-The signal path through the PMA that is exercised in the Loopback mode of operation is implementation specific, but it is recommended that this signal path encompass as much of the PMA circuitry as is practical.

Adjust Fig 83-5 and change note 3 to "See 83.5.7"

Response
ACCEPT IN PRINCIPLE.

Change notes 3 and 4 in Figure 83-5 to indicate "optional" rather than a required location for local and remote loopbacks.

Change in 83.5.7:
From:
"At the PMA service interface, the uppermost PMA sublayer (the one closest to the PCS) may provide a system loopback function."

To:
"The PMA sublayer may provide a local loopback function."

Editorial license to look for other unnecessary location constraints.
The PMA has no concern with the 'bit-rate'; that's what the MAC uses and the rate is modified by the line coding in the PCS before the PMA sees a signal.

Suggested Remedy
Change 'nominal bit-rate' to 'nominal signaling rate', twice in this paragraph.

ACCEPT.

In clause 45, the MDIO bits are not 'logic one' and 'logic zero', they are just one and zero.

Suggested Remedy
Delete 'logic', 7 times on this page.

ACCEPT.

I believe that 'does not indicate a valid signal since the test pattern cannot, in general, transit the PMA and still be recognized.' is not correct. If the input is PRBS31 on all lanes, the output will be PRBS31 on all lanes. However, the PCS won't know what to do with it.

Suggested Remedy
Change to 'does not indicate a valid signal since the test pattern is not meaningful to the PCS.' Same at line 46.

ACCEPT IN PRINCIPLE.

Change to "does not indicate a valid signal." No need for lengthy explanation about why.
Comment Type T Comment Status R
The only use for checking PRBS9 is if one can e.g. have most lanes carrying PRBS9 and one lane carrying PRBS31 for lane-by-lane diagnostics when the lanes may have been re-ordered. But I suspect this would need too much little-used PMA circuitry.

SuggestedRemedy
Consider deleting the check Tx TBD test pattern mode and check Rx TBD test pattern mode.

Response Response Status C
REJECT.

There is consensus to add PRBS9. All test patterns are optional.

Comment Type T Comment Status R
When transmit test pattern is disabled

SuggestedRemedy
When transmit square wave test pattern is disabled
These sentences 'When ... is disabled, the PMA returns to normal operation' need reworking or removal anyway, as another bit may divert the PMA from normal operation.

Response Response Status C
REJECT. Seems like overkill to try to spell out interaction and priorities between modes that are intended for use one at a time.

Comment Type T Comment Status A
four addressable instances for each possible PMA sublayer.

SuggestedRemedy
four addressable instances, one for each possible PMA sublayer.
or four addressable instances for each port.

Response Response Status C
ACCEPT IN PRINCIPLE.

four addressable instances, one for each possible PMA sublayer.

The copper length objective for 40 and 100 Gigabit Ethernet is at least 10 m over a copper cable assembly.
Comment Type: T  Comment Status: A
If we have PMAserver_SIGNAL.indication(SIGNAL_OK) it would be better to:

Suggested Remedy
Change Signal Indicate Logic to Signal Indication Logic, throughout.

Response  Response Status: C
ACCEPT.

Comment Type: T  Comment Status: R
It's not desirable to test a DTE receiver's sensitivity by sending it scrambled idle, because if the DTE is not explicitly put into test mode it will start sending frames to the tester. Better to send it scrambled RF. A network operator may wish to assess a signal received from another operator whose equipment it cannot put into test mode. That signal will be RF unless the other operator's receiver is receiving correctly, when it will be idle.

Suggested Remedy
It would be helpful if the test-pattern generator and checker could generate and check scrambled RF as well as scrambled idle. I expect that a checker could be made that counts errors well enough without being told whether RF or idle is intended.

Response  Response Status: C
REJECT.
This proposes essentially a new test pattern, I would like to see additional details on the proposal in a few slides and have that presented to the group to justify the request.

Comment Type: T  Comment Status: R
D1.1 comment 89 expresses concern at the burden of counting at 10 GHz. If this was a concern for one lane at 10G, it will be a concern for 4 or 10 lanes wide here.

Suggested Remedy
Investigate. We may wish to allow counting errored 66-bit blocks, which would be quite adequate if the errors are not bursty.

Response  Response Status: C
REJECT.
No specific proposal for change to PMA. Counting errored 66B blocks is done at PCS and not at PMA. This seems to refer to D1.0 comment 89 rather than D1.1.
In this:
Launch power per lane (min) in OMA minus TDP
We don't sum the powers and divide by the number of lanes. TDP may differ across the lanes. Min and max are generally at the end.

Suggested Remedy
Change to 'Launch power in OMA minus TDP, each lane (min). Change 'Average launch power per lane (max)' to 'Average launch power, each lane (max). Change 'Average launch power per lane (min)' to 'Average launch power, each lane (min). Also in Clause 88.

Response
ACCEPT IN PRINCIPLE.

In Tables 87-7, 88-7 and 88-11 change:
From "Signaling speed per lane (range)" to "Signaling speed, each lane (range)"
From "Average launch power per lane (max)" to "Average launch power, each lane (max)"
From "Average launch power per lane (min)" to "Average launch power, each lane (min)"
From "Launch power per lane (min) in OMA minus TDP" to "Launch power in OMA minus TDP, each lane (min)"

In Tables 87-8, 88-8 and 88-12 change where necessary:
From "Signaling speed per lane" to "Signaling speed, each lane (range)"
From "Average receive power, per lane (max)" to "Average receive power, each lane (max)"
From "Average receive power, per lane (min)" to "Average receive power, each lane (min)"
From "Receive power, per lane (OMA) (max)" to "Receive power, each lane (OMA) (max)"
From "Receive sensitivity (OMA), per lane (max)" to "Receive sensitivity (OMA), each lane (max)"
From "Stressed receiver sensitivity (OMA), per lane (max)" to "Stressed receiver sensitivity (OMA), each lane (max)"
From "Receive electrical 3 dB upper cutoff frequency, per lane (max)" to "Receive electrical 3 dB upper cutoff frequency, each lane (max)"
From "Vertical eye closure penalty, per lane" to "Vertical eye closure penalty, each lane"

Give editorial licence to change any other instances in clauses 86, 87 and 88 in a similar manner.

Footnote b, 'TDP is transmitter and dispersion penalty, see 87.8.6.' is anomalous. As we say right before the table, 'The 40GBASE-LR4 transmitter shall meet the specifications defined in Table 87-7 per the definitions in 87.8.' This footnote implies that the definitions of wavelength, OMA and the rest are not there. Footnoting each and every parameter would be silly.

Suggested Remedy
Delete footnote b. If others think some footnote is needed, footnote the first parameter (wavelength in this table) with a general footnote such as 'Parameters and associated test patterns are defined in 87.8'. Also in Clause 88.

Response
ACCEPT IN PRINCIPLE.
Delete footnote b in Tables 87-7 and 88-7
Also, if changes in anslow_04_0109.pdf are accepted, do not add proposed footnote shown as f in Table 86-8

With a normative TDP spec (see anslow_04_0109), we don't need a normative RIN spec.
IEEE are tightening their request to not mix normative and informative material. Also, not having a normative RIN12OMA should simplify the lane-by-lane pattern generation requirements in the PMA.

Suggested Remedy
Please delete the RIN12OMA row in Table 86-9. At 86 86.6.2 p257 line 30 (just above this table), add 'The transmitter's RIN12OMA should not exceed -128 dB/Hz.'

Response
ACCEPT IN PRINCIPLE.
Delete the row for RIN12OMA from Table 86-9
Do not add proposed text.
Note other comments 420, 426 and 558 tagged "RIN".

Give editorial licence to change any other instances in clauses 86, 87 and 88 in a similar manner.

Footnote b, 'TDP is transmitter and dispersion penalty, see 87.8.6.' is anomalous. As we say right before the table, 'The 40GBASE-LR4 transmitter shall meet the specifications defined in Table 87-7 per the definitions in 87.8.' This footnote implies that the definitions of wavelength, OMA and the rest are not there. Footnoting each and every parameter would be silly.

Suggested Remedy
Delete footnote b. If others think some footnote is needed, footnote the first parameter (wavelength in this table) with a general footnote such as 'Parameters and associated test patterns are defined in 87.8'. Also in Clause 88.

Response
ACCEPT IN PRINCIPLE.
Delete footnote b in Tables 87-7 and 88-7
Also, if changes in anslow_04_0109.pdf are accepted, do not add proposed footnote shown as f in Table 86-8

With a normative TDP spec (see anslow_04_0109), we don't need a normative RIN spec.
IEEE are tightening their request to not mix normative and informative material. Also, not having a normative RIN12OMA should simplify the lane-by-lane pattern generation requirements in the PMA.

Suggested Remedy
Please delete the RIN12OMA row in Table 86-9. At 86 86.6.2 p257 line 30 (just above this table), add 'The transmitter's RIN12OMA should not exceed -128 dB/Hz.'

Response
ACCEPT IN PRINCIPLE.
Delete the row for RIN12OMA from Table 86-9
Do not add proposed text.
Note other comments 420, 426 and 558 tagged "RIN".
To be clear, we should give the eye mask hit ratio spec in the table as we do for the other eye masks. Also this is preparation towards a common definition of eye mask.

Suggested Remedy

Insert row in table under Transmitter eye mask definition, (indented) Eye hit ratio 5 x 10^-5 hits per sample.
In 86.7.5.7.1, change
The transmitter shall achieve a hit ratio lower than 5 x 10-5 hits per sample, where "hits" are...
to
The transmitter shall achieve a hit ratio lower than the limit of hits per sample specified in the appropriate table e.g. Table 86-8 or 5 x 10-5 hits per sample if not otherwise specified. "Hits" are...

Revise PICS SOM8 to match.
Consider making similar changes in tables 87-7, 88-7 and 88-11 and clauses 86.7.3.2.1, 86.7.5.7, 86.7.5.7.1, 87.8.9 and 88.9.8.

Respond

ACCEPT IN PRINCIPLE.

Insert in table 86-8 Eye hit ratio 5 x 10^-5 hits per sample.
In 86.7.5.7.1, change
The transmitter shall achieve a hit ratio lower than 5 x 10-5 hits per sample, where "hits" are...
to
The transmitter shall achieve a hit ratio lower than the limit of hits per sample specified in the appropriate table or 5 x 10-5 hits per sample if not otherwise specified. "Hits" are.

For the same reasons as for LRM, sinusoidal jitter tolerance testing should be separated.

Suggested Remedy

For the stressed receiver sensitivity, use just one SJ setting e.g. at 80 GHz.
Add rows to Table 86-8:
Conditions of receiver jitter tolerance test:
Jitter frequency and peak to peak amplitude (75, 5) (kHz, UI)
Jitter frequency and peak to peak amplitude (375, 1) (kHz, UI)
Add new subclause:
86.7.5.10 Receiver sinusoidal jitter tolerance
Receiver sinusoidal jitter tolerance for each lane is defined as in 68.6.11, with the following differences:
a) The pattern to be received is specified in Table 86-16;
b) The other receive lanes not being tested are receiving Pattern 1, 2, 3, 5, or portion(s) of a 10GBASE-R, 40GBASE-R4 or 100GBASE-R10 signal, and the transmitter is transmitting one of these signals using all lanes, and
c) The transmitter and the receiver are not synchronous.

Respond

ACCEPT IN PRINCIPLE.
See response to 579.
Comment Type: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID

Page 127 of 141

**IEEE P802.3ba D1.1 40Gb/s and 100Gb/s Ethernet comments**

**Response #612**

**Cl 86 SC 86.7.5.4 P 267 L 45 # 612**

Dawe, Piers  Avago Technologies

**Comment Type** T  **Comment Status** R

Clause 52 stressed sensitivity for 10GBASE-S uses a comparison of a sensitivity measurement of a good signal with a reference receiver without a transversal filter, and of the signal (transmitter) under test with the same reference receiver but with the transversal filter in place. This is disliked.

**Suggested Remedy**

I hope we can get to a TDP definition where the same reference receiver is used with both the reference signal and the signal under test.

**Response**  **Response Status** C

REJECT.

This comment was WITHDRAWN by the commenter.

---

**Response #613**

**Cl 85 SC 85.3.1 P 225 L 17 # 614**

Dawe, Piers  Avago Technologies

**Comment Type** TR  **Comment Status** R

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

**Suggested Remedy**

Add text in Clause 85 saying that 40GBASE-CR4 and 100GBASE-CR10 use Parallel Detection.

**Response**  **Response Status** C

REJECT.

Consistent with CX4, all cable assembly measurements are to be made between TP1 and TP4 as illustrated in Figure 85-2. Two mated connector pairs have been included in the cable assembly specifications defined in 85.9. TP1 and TP4 are not test points for the measurements of nonlinear active elements like transmitters and receivers.

PCB trace loss at TP0 defined (Tx_pcb) and at TP5 (Rx_pcb.).
Comment Type TR  Comment Status R
Submitted again with clarification as the response did not address the main point. 84.8 refers to 72.7, which says ‘...the PMD sublayer is standardized at test points TP1 and TP4 as shown in Figure 72-1. The electrical path from the transmitter block to TP1, and from TP4 to the receiver block, will affect link performance and the measured values of electrical parameters used to verify conformance to this standard. Therefore, it is recommended that this path be carefully designed.’ In other words, there is no expectation that a board from vendor A, a backplane from B and another board from C can be expected to interoperate reliably, because each of them can spend as much of the shared channel budget as he pleases. This is not an interoperability spec; it’s just an advertisement for some ICs. Is this what we want?

An interoperability spec must have PMD electrical specs related to the connectors so that boards from different vendors can be interchanged. This true whether or not the channel is normative. For my part, I can’t see why the backplane from one connector to the other should not be normative.

Suggested Remedy
Discuss. Options are: make Clause 84 into a proper interoperability spec with PMD test points related to the connectors (Clause 86 will have to do much of that work anyway), delete the clause, move it to an annex, or accept that it’s not a proper spec.
Also consider giving a normative backplane spec from one connector to the other - Clause 85 has a normative cable spec.

Response C
REJECT.
Making any part of the backplane channel spec normative is in conflict with the adopted baseline proposal.
For reference this is the final accepted response to the comment made against the 1.0 draft:

“The 802.3ap project specified the backplane interconnect characteristics to be informative, with a normative description of receiver testing, which ensures interoperability.

The baseline proposal voted in by the task force for 40GBASE-KR4 adopted the 802.3ap informative channel. Making the channel normative as the commenter seems to request would be big change.”

Suggested Remedy
Change SP1 Dynamic Skew output and tolerance limits to 150 ps or less, e.g. 100 ps. Similarly, reduce SP2 Dynamic Skew output and tolerance limits to 300 ps or less, e.g. 200 ps.

Response C
REJECT.
SP1 is defined at the “lowest” CAUI, which could include dynamic skew accrued through up to 3 PMA sublayers and FEC. Any change here needs to be aligned with clause 80.4

Suggested Remedy
Use the six TP compliance points and the compliance card transfer characteristics defined in 86.7.1, relegate the points in Fig 83A-2 to informative reference points like A and D in SFP+. Or if desperate, delete all of 83A.

Response C
ACCEPT IN PRINCIPLE.
See remedy in comment 295
It's not clear that these jitter specs allow the two concatenated CDRs and an optical link, XFP style, that will be wanted when connecting e.g. a 40GBASE-LR4 module.

Modify the jitter specifications to be sure they do. This may mean that the specs on the transmit side and receive side differ - I think the single-tone sinusoidal jitter masks (Fig. 83A-10) have to differ. See dawe_03_1108.pdf.

ACCEPT IN PRINCIPLE.

Refer to comment 411 and dambrosia_01_0109 for nAUI

There seem to be more test pattern and loopback options than are needed.

See presentation.

REJECT.

Per baseline agreement channel parameters consistent with 10GBASE-KR in 802.3ap Annex 69B.

Dynamic Skew at SP2 (400 ps or 2 UI) is excessive; OIF has 1.5 UI at SP1(?) and that's after they sandbagged it. Because a group of 4 differential traces can be kept more equal in length than a group of 10, the Dynamic Skew for 40G should be lower than that for 100G. Removing an editor's note.

Change limit for Dynamic Skew at SP2 to 300 ps (which is 3 UI). Remove the editor's note at line 28.

ACCEPT IN PRINCIPLE.

Make no change to Dynamic skew limit (renamed to Skew Variation by comment 282) see Response to comment 616

Remove editor's note at line 28

see comments 625, 616 and 504

No consensus on 21 recommendations included in dawe_02_0109 as a group. Submit individual, specific remedies for each of the recommendations so their merits can be discussed individually.
Cl 00 SC 0 P 119 L 44 # 622

Dawe, Piers
Avago Technologies

Comment Type TR Comment Status A

Skew

Nomenclature: D1.1 uses 'Total Skew' and 'Dynamic Skew'. D1.0 used 'skew' and 'dynamic skew'. I saw nothing in the comment database to justify 'Total Skew', and it isn't a total. It is not likely that what is called 'Dynamic Skew' will be dynamic (means fast-moving) and however slowly it changes, it still matters. Before this project, OIF-CEI-02.0 had defined 'Uncorrelated Wander' but they don't seem to have a good name for the largest skew between any two lanes in a group, either. Names like 'Maximum Skew' or 'Greatest Skew' could allow confusion between a maximum across lane-pairs and a maximum through time.

I've made this a TR because it affects multiple clauses.

Suggested Remedy

Change 'Dynamic Skew' to 'Uncorrelated Wander' throughout.

Response

ACCEPT IN PRINCIPLE.

See response of #282.

Cl 83 SC 83.5.8 P 192 L 19 # 624

Dawe, Piers
Avago Technologies

Comment Type TR Comment Status A

Line loopback is something you should not expect of the module. In particular, small 10G modules are likely to use a double decker construction with the separate transmit and receive planes and no cheap and satisfactory way of making a high speed connection between them.

Suggested Remedy

Change

Line loopback is only applicable for the lowermost PMA (the one closest to the PMD) at the PMD service interface. When line loopback is enabled, each bit received over the PMD service interface via the x=0 to q=1. Note that "PMA server" can represent the FEC, PMD, or another PMA sublayer.

PMAservice_UNITDATA.indication(x_bit) primitive is sent back toward the PMD via the
PMAservice_UNITDATA.request(x_bit) primitive.

If the PMD can be removed, line loopback is only applicable for the PMA directly above the demountable electrical connector closest to the PMD at the PMD service interface. If the PMD cannot be removed, line loopback is only applicable for the lowermost PMA (the one closest to the PMD) at the PMD service interface.

Adjust Fig 83-5 and change note 4 to "See 83.5.7."

Response

ACCEPT IN PRINCIPLE.

Line loopback is optional, if implemented then bit transparency to the line must be maintained. Editorial license to add this in.

Change

"Line loopback is only applicable for the lowermost PMA (the one closest to the PMD) at the PMD service interface." to
"Remote loopback, if provided, should be implemented in a PMA sublayer close enough to the PMD to maintain the bit sequence on each individual PMD lane."

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

Comment ID # 624
Page 130 of 141
2/7/2009 12:56:22 PM
Comment Type TR  Comment Status R
Dynamic Skew at SP2 (400 ps or 4 UI) is excessive; OIF has 1.5 UI at SP1(?) and that's after they sandbagged it. Because a group of 4 differential traces can be kept more equal in length than a group of 10, the Dynamic Skew for 40G should be lower than that for 100G. See another comment for estimates of dynamic skew; it's hard to see it being as large as 50 ps at SP1.

SuggestedRemedy
Change limit for Dynamic Skew at SP1 to 0.1 or 0.15 ns (which is 1.5 UI for 10G lanes). Change limit for Dynamic Skew at SP2 to 0.2 or 3 ns (which is 3 UI for 10G lanes).

Response  Response Status C
REJECT. See response to comment #616.

Comment Type TR  Comment Status A
The eye mask coordinates allow the host to generate a really large, slow, noisy eye. Reflections with a large eye will degrade the small opening specified in the eye. Slow and noisy edges will cause the transmitted optical signal to have excessive jitter. This same problem was observed and fixed in SFP+. Options for fixing are:
Reduce X2 from 0.33;
Introduce a relative mask;
Introduce a Qsq limit of 50 or so, and require the host to keep its baseline wander in check (SFP+ is attempting this);
Tighten the hit ratio. Because the measurement time can be used for a relative and absolute mask, the first and last options do not add test cost.

SuggestedRemedy
Reduce X2. Apply a relative mask with the same X1, X2, and Y1, Y2 of 0.25, 0.25.

Response  Response Status C
ACCEPT IN PRINCIPLE. See Response to comment 425 Invite advice from the statistical eye ad-hoc

Comment Type TR  Comment Status R
Expecting the analog-oriented power-challenged semiconductors in a module to generate and check all these test patterns. It is much easier done in a bigger more digitally oriented IC in the host.

SuggestedRemedy
Change Where the output lanes of the PMA appear on a physically instantiated interface XLAUI/CAUI or the PMD service interface (whether or not it is physically instantiated), the PMA may optionally generate and detect test patterns.

Response  Response Status C
REJECT. The concern is covered by the fact that test patterns are optional.

Comment Type TR  Comment Status R
Text says all these pattern generators, checkers and loopbacks are optional. This diagram implies otherwise.

SuggestedRemedy
Add new first note:
Loopbacks and test pattern generators and detectors are optional.

Response  Response Status C
REJECT. The text is clear that these are optional. It doesn't need to be reiterated everywhere test patterns and loopbacks are mentioned or illustrated.
This clause can't tell the PCS what to do. That's what the PCS clause is for - and it already does so in 82.6

Suggested Remedy

Change 'shall' to 'must', delete 84.11.4.1.

Response

ACCEPT.

also need to remove reference to Clause 49.

Change to

"The PCS associated with this PMD is required to support the AN service interface primitive AN_LINK.indication defined in 73.9. (See 82.6.)"

and delete 84.11.4.1.

Also fix issue with AN_LINK.indication in Clause 73:

Delete editors note at end of 73.10.1

Add sentence at end of 73.9.1.2

"This primitive is an out-of-band signal and may be implemented as a PCB signal trace when the AN layer and PCS are in separate chips."
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
<th>Suggested Remedy</th>
<th>Response</th>
</tr>
</thead>
</table>
| 631        | T            | R              | KR felt it sufficient to state that the path between the receiver to testpoint be "carefully designed". To ensure future flexibility, perhaps we should do the same for the following TBD. "Any interconnect which has a loss less than (SDD21(dB) (TBD) ) f is given in GHz)"

**Suggested Remedy**

Change

Any interconnect which has a loss less than (SDD21(dB) (TBD) ) f is given in GHz) between the XLAUI/CAUI receive pin and Receive Compliance Point may be used as long as receiver parameters of Table 83A-2 are met.

Therefore, it is therefore recommended that this path be carefully designed.

**Response**

REJECT.

This comment was WITHDRAWN by the commenter.

| 632        | T            | A              | following editor note has been addressed:

[Editor's note: (to be removed prior to publication) - The Return Loss limits in Figure 83A-5 and Figure 83A-9 may have to be plotted in log linear scale with loss being positive. The definition or formatting to be reconciled similar to the definition or plots in base spec 802.3-2008 Annex 69B]

**Suggested Remedy**

remove editors comment

**Response**

ACCEPT.

| 633        | T            | A              | Test Pattern generation / detection is optional. (see 83.5.9 - Where the output lanes of the PMA appear on a physically instantiated interface XLAUI/CAUI or the PMD service interface (whether or not it is physically instantiated), the PMA may optionally generate and detect test patterns)

**Suggested Remedy**

Change "Provide test pattern generation and detection" to "Optional provide test pattern generation and detection"

**Response**

ACCEPT.

| 634        | T            | A              | Many potential test patterns are listed. Suggest that square wave patterns are not necessary especially if short (PRBS9) patterns is included

**Suggested Remedy**

remove square wave patterns from test pattern list (also change transmitter OMA test pattern to PRBS9)

**Response**

ACCEPT IN PRINCIPLE.

See Response to comment 505 for changes to Table 86-15 and comment 566 for changes to Table 86-16 and OMA measurement

See also comments 562, 473, 563, 564, 205, 463, 460, 462, 565, 332.
### Draft 1.1 Comments

**IEEE P802.3ba D1.1 40Gb/s and 100Gb/s Ethernet comments**

**Task force Review**

<table>
<thead>
<tr>
<th>CI</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>Comment ID</th>
<th>Commenter</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>86</td>
<td>86.7.4.3</td>
<td>266</td>
<td>19</td>
<td>635</td>
<td>Latchman, Ryan</td>
<td>Gennum Corp</td>
</tr>
<tr>
<td>87</td>
<td>87.8.1</td>
<td>292</td>
<td>38</td>
<td>636</td>
<td>Latchman, Ryan</td>
<td>Gennum Corp</td>
</tr>
<tr>
<td>88</td>
<td>88.9.1</td>
<td>321</td>
<td>36</td>
<td>637</td>
<td>Latchman, Ryan</td>
<td>Gennum Corp</td>
</tr>
<tr>
<td>83A</td>
<td>83A.2.1</td>
<td>351</td>
<td>1</td>
<td>638</td>
<td>Latchman, Ryan</td>
<td>Gennum Corp</td>
</tr>
</tbody>
</table>

**Comment Type**: T (Technical)  
**Comment Status**: A (Accepted)  
**Suggested Remedy**: Change transition time pattern to PRBS9

**Comment**

Transition time can be measured with PRBS9 pattern which is used in jitter measurements. Change transition time pattern to PRBS9

**Suggested Remedy**

Change text to "The normative test pattern is the PRBS9 test pattern"

**Response**

ACCEPT IN PRINCIPLE.

See response to comment 505 for changes to Table 86-15 and comment 566 for changes to Table 86-16 and OMA measurement. See also comments 206, 437, 464.

**Comment Status**: A  
**Response Status**: C

---

<table>
<thead>
<tr>
<th>CI</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>Comment ID</th>
<th>Commenter</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>88</td>
<td>88.9.1</td>
<td>321</td>
<td>36</td>
<td>637</td>
<td>Latchman, Ryan</td>
<td>Gennum Corp</td>
</tr>
<tr>
<td>83A</td>
<td>83A.2.1</td>
<td>351</td>
<td>1</td>
<td>638</td>
<td>Latchman, Ryan</td>
<td>Gennum Corp</td>
</tr>
</tbody>
</table>

**Comment Type**: T (Technical)  
**Comment Status**: A (Accepted)  
**Suggested Remedy**: Remove square pattern from test pattern list. Replace square wave with short PRBS (in OMA evaluation section)

**Response**

ACCEPT IN PRINCIPLE. Use square or PRBS9. See Response to comment 439. See also comments 636, 438 and 441.

**Comment Status**: R  
**Response Status**: C

---

<table>
<thead>
<tr>
<th>CI</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>Comment ID</th>
<th>Commenter</th>
<th>Company</th>
</tr>
</thead>
<tbody>
<tr>
<td>83A</td>
<td>83A.2.1</td>
<td>351</td>
<td>1</td>
<td>638</td>
<td>Latchman, Ryan</td>
<td>Gennum Corp</td>
</tr>
</tbody>
</table>

**Comment Type**: T (Technical)  
**Comment Status**: R (Rejected)  
**Suggested Remedy**: Any interconnect which has a loss less than (SDD21(dB) (TBD) ) f is given in GHz

**Response**

REJECT. This comment was WITHDRAWN by the commenter.

Too many "Therefore" in last line. Change last line to: It is therefore recommended that this path be carefully designed.
Since the same external encoding is used for ordered sets as in clause 46, better to say that they are aligned to 8-byte boundaries rather than that they are extended to 8 bytes.

Suggested Remedy
Replace "The behavior of the fault signalling is the same as it is for Clause 46 with the exception that the ordered sets are extended to eight bytes." with "The behavior of the fault signalling is the same as it is for Clause 46 with the exception that the ordered sets are aligned to eight byte boundaries."

Response
ACCEPT IN PRINCIPLE.

[Editor's note: Commenter has not indicated the comment type. Assigned comment type as Technical]

REJECT.
This use of this phrase is consistent with Clause 44 in base standard.

Don't need to phrase descriptive text as a requirement.

Suggested Remedy
Replace "The 64 TXD and eight TXC signals shall be organized into eight data lanes, as shall the 64 RXD and eight RXC signals (see Table 81-2)." with "The 64 TXD and eight TXC signals are organized into eight data lanes, as are the 64 RXD and eight RXC signals (see Table 81-2)."

Response
ACCEPT IN PRINCIPLE.

This is consistent with clause 46, and also has a PICS associated with it.
Comment Type: E  Comment Status: R
Don't need to phrase descriptive text as a requirement

SuggestedRemedy
Replace "The Reconciliation Sublayer (RS) shall map the signals provided at the MII to the PLS service primitives defined in Clause 6" with "The Reconciliation Sublayer (RS) maps the signals provided at the MII to the PLS service primitives defined in Clause 6"

Response: REJECT.
This is consistent with clause 46.

Comment Type: E  Comment Status: A
The PCS connects to the PMD via the PMA and possibly FEC, not "directly"

SuggestedRemedy
Delete the word "directly"

Response: ACCEPT.

Comment Type: E  Comment Status: A
Better to consider "n" to be the number of PCS lanes which are numbered 0 through n-1

SuggestedRemedy
Replace largest lane number by n-1

Response: ACCEPT.
Same as comment #442.

Comment Type: E  Comment Status: R
Could parameterize description of primitives.

SuggestedRemedy
Describe as PMD_UNITDATA.request/indication0 through PMD_UNITDATA.request/indication n-1 for an n-lane interface (n=4 or 10)

Response: REJECT.

Add the following description to 85.2

The following PMD service primitives are described as PMD_UNITDATA.request/indication0 through PMD_UNITDATA.request/indication n-1 for an n-lane interface (n=4 or 10):

Comment Type: E  Comment Status: A
Letting n=3 or n=9 isn't intuitive since n doesn't correspond to any attribute of the implementation. Use n=4 or n=10 (the number of lanes), and number primitives and lanes throughout the clause as 0 through n-1

SuggestedRemedy
Let n=the number of lanes and number primitives and lanes throughout the clause as 0 through n-1.

Response: ACCEPT IN PRINCIPLE.
The root cause is that the lanes are numbered from 0, which isn't intuitive. In the format "PMD_UNITDATA.requestn(tx_bit)" we need a symbol for the last lane ID: "PMD_UNITDATA.requestn-1(tx_bit)" isn't good. In future, we should change the lane numbering to start from 1 throughout or make the lane ID a subscript. For now, uses of n+1 later in the clause replaced by "4 or 10" or eliminated.
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>SC</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>649</td>
<td>45.2.1.12a.9</td>
<td>ER</td>
<td>A</td>
<td>Reference to 83.6.7 seems incorrect - 83.5.9 is test patterns, 83.6 is PMA MDIO function mapping. Same in line 22.</td>
</tr>
<tr>
<td>650</td>
<td>80.1.4</td>
<td>T</td>
<td>A</td>
<td>Should we say here that links &gt;30km are engineered links with attenuation below the limits described in clause 88?</td>
</tr>
<tr>
<td>651</td>
<td>80.2.7</td>
<td>T</td>
<td>A</td>
<td>lanes should be 0 to n-1 (rather than 0 to n) to align with description in clause 83</td>
</tr>
<tr>
<td>652</td>
<td>80.3</td>
<td>T</td>
<td>A</td>
<td>Need to qualify statement about dynamic skew since it isn't absolute (there is no guarantee that if the link is brought down and back up again, the PCS lanes will be on the same physical lanes).</td>
</tr>
<tr>
<td>653</td>
<td>80.4</td>
<td>T</td>
<td>A</td>
<td>Add informative Annex and remove editor's note</td>
</tr>
</tbody>
</table>

**Response**

- Replace with 83.5.9 or 83.6 depending on what was intended.
- Replace with 83.5.9
- REJECT. The intent of 80.1.3 is to define the nomenclature employed by 40G and 100G, so it not necessary to be so specific in this subclause.
- ACCEPT IN PRINCIPLE.
- ACCEPT IN PRINCIPLE.
- ACCEPT IN PRINCIPLE.
- See comment #168 for PMA delay constraints
- ACCEPT IN PRINCIPLE.
- ACCEPT IN PRINCIPLE.
- Change "x = 0 to n" to "x = 0 to n-1" in 80.2.7 (4 instances)

**Comment Status:**
- A/accepted
- R/rejected
- C/closed
- U/unsatisfied
- Z/withdrawn

**Response Status:**
- O/open
- C/closed
- W/written
- Z/withdrawn

**Type:**
- TR/technical required
- ER/editorial required
- GR/general required
- T/technical
- E/editorial
- G/general

**Task force Review:**
- IEEE P802.3ba D1.1 40Gb/s and 100Gb/s Ethernet comments Draft 1.1 Comments
- Task force Review

**Sort Order:**
- Comment ID
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>SC Type</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>C</th>
<th>Trowbridge, Stephen</th>
<th>Alcatel-Lucent</th>
</tr>
</thead>
</table>
| 655        | T       | 83 | 186 | 35 | # | 83.2 | | Comment Type: T, Comment Status: R
|             |         |    |     |    |   |      | | Decide whether (a) System loopback should be optional anywhere there is an exposed interface above; and if so, (b) Can test pattern generation/detection be limited to generating in transmit path and detecting in receive path, combining with loopback? Tradeoff of extra complexity and more registers for finer granularity fault localization.
|             |         |    |     |    |   |      | | Suggested Remedy: A presentation will be provided to illustrate the two options. A decision should be made based on the consensus.
|             |         |    |     |    |   |      | | Response: REJECT.
|             |         |    |     |    |   |      | | This comment was WITHDRAWN by the commenter.
| 656        | T       | 83 | 193 | 38 | # | 83.5.9 | | Comment Type: T, Comment Status: A
|             |         |    |     |    |   |      | | Note other comment on decision between test pattern generation/detection in both directions or only generate in Tx path and detect in Rx path combined with loopback.
|             |         |    |     |    |   |      | | Suggested Remedy: In the event that it is decided to only generate test patterns in the Tx path and detect in the Rx path combined with loopback, the editors note can be removed since the case in question does not occur. If the decision is to generate and detect test patterns in both directions, one possibility is to send a test pattern downward in the Tx direction when in check test pattern mode for the Tx path from above. But this could be problematic if the interface below is not physically instantiated.
|             |         |    |     |    |   |      | | Response: ACCEPT IN PRINCIPLE.
|             |         |    |     |    |   |      | | See presentation trowbridge_02_0109. Since it was decided to retain detection in Tx path, just gearbox test pattern even though garbage is sent downstream. Editorial License.
| 657        | T       | 45 | 194 | 1 | # | 83.5.9 | | Comment Type: T, Comment Status: A
|             |         |    |     |    |   |      | | Reconcile Tx square wave pattern with optical interface comment resolution. Is it necessary to have separate Tx square wave for each lane, with lanes not under test sending PRBS31?
|             |         |    |     |    |   |      | | Suggested Remedy: Align per consensus to be reached in January 2009. If separate Tx square wave per lane, also need clause 45 registers for enabling per lane.
|             |         |    |     |    |   |      | | Response: Response Status: C
|             |         |    |     |    |   |      | | ACCEPT IN PRINCIPLE.
|             |         |    |     |    |   |      | | Have a bit per lane that controls enabling a square wave on that lane, any lane that the bit is not set for passes data as normal. Editorial license to implement this in clause 83 and 45.
| 658        | T       | 45 | 194 | 1 | # | 45.2.1.12c | | Comment Type: TR, Comment Status: A
|             |         |    |     |    |   |      | | The PMA clause indicates a per lane error counter register (up to 10 lanes toward a physically instantiated interface) and not only a single register. Also need error counters in Tx and Rx direction. Can use the same error counter register for PRBS31 and whatever is selected as the short test pattern (e.g., PRBS9)
|             |         |    |     |    |   |      | | Suggested Remedy: Change to per lane test pattern error counter registers in each direction.
|             |         |    |     |    |   |      | | Response: Response Status: C
|             |         |    |     |    |   |      | | ACCEPT IN PRINCIPLE.
|             |         |    |     |    |   |      | | See resolutions to #128
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Module Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>#659</td>
<td>TR</td>
<td>A</td>
<td>Add separate enable for test pattern checker (which may be in different PMA from the generator), and for short test pattern generate and check.</td>
</tr>
<tr>
<td>#660</td>
<td>TR</td>
<td>A</td>
<td>Need enable square wave test pattern, per lane?</td>
</tr>
<tr>
<td>#662</td>
<td>TR</td>
<td>A</td>
<td>Modify Fig. 83A-2 to include a connectorized module interface or add an additional diagram.</td>
</tr>
</tbody>
</table>

**Comment #659**

**Comment Type:** TR

**Comment Status:** A

Clause 83 indicates separate enable for test pattern generate and test pattern detect. Also need enable for selected short test pattern (e.g., PRBS9).

**Suggested Remedy:**
Add separate enable for test pattern checker (which may be in different PMA from the generator), and for short test pattern generate and check.

**Response:** ACCEPT IN PRINCIPLE.
See comment #131 response.

**Comment #660**

**Comment Type:** TR

**Comment Status:** A

Need enable square wave test pattern, per lane?

**Suggested Remedy:**
Add enable square wave test pattern.

**Response:** ACCEPT IN PRINCIPLE.
See remedy comment 295

**Comment #662**

**Comment Type:** TR

**Comment Status:** A

Fig. 83A-2 does not include a connectorized module interface.

**Suggested Remedy:**
Modify Fig. 83A-2 to include a connectorized module interface or add an additional diagram.

**Response:** ACCEPT IN PRINCIPLE.
See remedy 295
The return loss spec needs to be modified to accept short cables with bad return loss and longer cables with good return loss.

Suggested Remedy
Consider adding an Insertion loss to return loss ratio similar to the ICR curve.
(Presentation will be provided)

Response
ACCEPT IN PRINCIPLE.

Replace 85.10.4 Cable assembly return loss Equation (85-18) and Equation (85-19).

Return Loss(f) = 10 for 100 MHz = f < 1250 MHz
Return Loss(f) = 10 - 7 x log10(f/1250) for 1250 MHz = f = 10000 MHz

Row 2, column 2 in the Table in section 85.13.4.5 showing channel specifications has a spelling mistake.

Suggested Remedy
Correct "Insertion loss" to "Insertion Loss"

Response
ACCEPT IN PRINCIPLE.

Correct the typo.
Overtaken by events.

The equations for generating the fit line for any data to test to the limit line as specified in equations 85-3 through 85-8 are faulty (See attached supporting document.)

The equation just extends what was accepted in IEEE 802.3ap as the equation. In light of the presented data, it is necessary to revisit the equation. The fit line, as it stands now, can cause some connectors which actually pass the requirements in raw data to fail the requirements with the fit line.

Suggested Remedy
Need to come up with a new equation for the fit line which takes into account the low frequency data also when coming up with the fit line to test against the limit line.

Resolution will be provided in a supporting document.

If the commenter believes the 802.3ap-2007 standard is faulty the commenter should submit a maintenance request against the base standard.

See comment#667 for rationale.
Comment Type: TR
Comment Status: R

The equations for generating the fit line for any data to test to the limit line as specified in equations 85-24 through 85-29 are faulty (See attached supporting document.)

The equation just extends what was accepted in IEEE 802.3ap as the equation. In light of the presented data, it is necessary to revisit the equation. The fit line, as it stands now, can cause some connectors which actually pass the requirements in raw data to fail the requirements with the fit line.

Suggested Remedy

Need to come up with a new equation for the fit line which takes into account the low frequency data also when coming up with the fit line to test against the limit line.

Resolution will be provided in a supporting document.

Response: C
Response Status: C

REJECT.
For sub-task force review. Although I generally agree that the least mean squares line fit can be improved for CR4 and CR10 ICR I had looked at this and observed that all of the line fit alternatives I utilized had issues with different channel structures (response shapes). I recommend extending this effort into working group ballot and not replace current method without extensive review of a wider range of channel topologies and response shapes.