The term 'nAUI' should be used rather than XLAUI / CAUI when talking about the optional physical instantiation in general terminology rather than "XLAUI / CAUI"

Also, given industry work on developing higher speed electrical interfaces, a number should be added at the end of the name to indicate the lane width.

Suggested Remedy
- replace XLAUI / CAUI with nAUI when talking about the optional physical instantiation in general terminology.
- Use CAUI-10 for 10 lane wide CAUI.
- Use XLAUI-4 for 4 lane wide XLAUI.
- Modify definitions in 1.4 accordingly.

Proposed Response
PROPOSED ACCEPT IN PRINCIPLE.

The term XLAUI or CAUI clearly distinguishes between the physical instantiations of 40G instantiation and 100G instantiation of the PMA service interface. Moreover this also shows that these two interfaces are not interoperable even though they share the same electrical characteristics on each of the lanes.

Using the term nAUI does not allow this distinction, because the term might imply three different possibilities: XALUI, CAUI or both. A device implementation needs to still clearly specify if that device supports either XLAUI, or CAUI, or both.

Moreover since there is already XAUU for 10G, so the term nAUI may be (mis)interpreted as encompassing this interface as well.

Discuss in BRC about future possibility of nomenclature of narrower lane width physical instantiations of PMA service interface.

Examples of future narrow interface possibilities: 4 lane x 25 GBd version for 100G, and a 2 lane x 20 GBd or 1 lane by 40GBd for 40G. In each of these cases the physical, electrical, and channel characteristics may be different with one another and different from existing XLAUI or CAUI. So proper distinctions should be made to clearly identify the interface since they may not be compatible with one another. We can leave current terminonology as it is and have the future version(s) add additional distinction (could be a prefix/suffix).

Discuss in BRC.

The document does not use consistent terminology for setting bits to ONE, one, 1 and ZERO, zero, 0.

Suggested Remedy
While it is not very confusing, it would be nice for the standard to use standard terminology. Change to ONE and ZERO everywhere and define these terms in the introduction.

Proposed Response
PROPOSED ACCEPT IN PRINCIPLE.

In most cases the base document uses logic ZERO and logic ONE, though there are few instances of logic 0 and logic 1.

To be consistent change to logic ZERO and logic ONE in P802.3ba document.
**Comment Type**: ER  **Comment Status**: D

D'Ambrosia, John  Force10 Networks

**Comment**: Annexes 83B and 85A have equations but have not illustrated these equations via figures. This is inconsistent with other clauses where equations have been illustrated. Also in Annex 83B actual equations have been entered into table entries (see Table 83B-2 and 83B-4), rather than being added as equations into the text body, where the equation # is referenced in the table.

**Suggested Remedy**

Equations that define limits should be plotted in order to be consistent with the rest of the draft. Equations should not be entered as actual table entries. Instead, equations should be entered in text, and then the actual equation # referenced in the table entry.

**Proposed Response**  **Response Status**: W

PROPOSED ACCEPT IN PRINCIPLE.

**Comment Status**: D

**Response Status**: W

D'Ambrosia, John  Force10 Networks

---

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

Anslow, Peter  Nortel Networks

**Comment**: Clauses 84 through 88 show clause 83A XLAUI/CAUI as optional in Tables 84-1, 85-1, 86-2, 87-1 and 88-1. However, clause 83B could be used also and in some cases is more appropriate than 83A.

**Suggested Remedy**

In Tables 84-1, 85-1, 86-2, 87-1 and 88-1 show clause 83B as optional.

**Proposed Response**  **Response Status**: W

PROPOSED ACCEPT IN PRINCIPLE.

Show 83B as optional for Tables 86-1, 87-1 and 88-1. Discuss if applicable for backplane and copper clauses.
### Gustlin, Mark Cisco

#### Comment Type: TR

Clause 86 and 85 are not consistent in their PCB loss budgets. The CR4/CR10 PCB loss allowances are not sufficient for future PCB board designs, and do not support at least 4" of standard PCB trace.

**Suggested Remedy**

- Change the reach objective for CR4/10 to 7m (from 10m) to allow for more loss to be assigned to the PCB.
- Change clause 85A.4 from 4.74db total loss for tx / rx host boards to 5db per side for the PCB + connector + impairments budget.
- Change clause 86A.6 to 5dB per side for the PCB + connector + impairments. Note that this is an informative change since the PCB budget is informative, and this channel is jitter limited.
- Change Eq 86A-20 to reflect 3.5dB (Host trace) + 0.87dB (connector) + 1.26dB (HCB trace) + 0.83dB (impairments) = 6.26dB at 5.15625 GHz

See gustlin_04_0709 for details of the changes.

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE.

**Response Status**

W

### Grow, Robert Intel

#### Comment Type: ER

We have a general problem with numbering. Not all projects are following the same convention, for example, P802.3av is inserting clauses and instructing renumbering, but this project attempts to follow the Style Guide (laudable but difficult for us). As is shown by this draft, the Style Manual convention doesn't support adding a new subclause when it is the first at that level (add 45.2.1.4.1a before 45.2.1.4.1), and it doesn't support alphabetic subclause ordering when doing this more than once (something we frequently do. For example in Clause 45, a second amendment would typically place a new bit definition for example as 45.2.1.4.1b before 45.2.1.4.1, but place a new register definition 45.2.1.12b after 45.2.1.12a.

**Suggested Remedy**

Work with WG Chair to better coordinate projects and use consistent style for indicating changes. Though it can get painful (and was why I built a spreadsheet for clause 45 to manage amendments), I think we need to not follow the Style Guide for subclause insertions (which is add letters without renumbering) but rather insert and renumber, but I'll leave that decision to the WG Chair and if he chooses to the WGAC.

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE.

Discuss with WG chair and follow a consistent numbering style across amendment projects.

### Ghiasi, Ali Broadcom

#### Comment Type: TR

The process to resolve comment in CL 85 is broken, with meeting running past scheduled time past midnight, decision are made with just 5-6 people in the room, comments are subjectively rejected by the editor, when late the editor gives himself permission to change the comment database since the meeting was already past midnight.

**Suggested Remedy**

- We need to adhere to scheduled time, editors should not enter resolution to comments outside the meeting time, do not reject a person comments attending different track without giving him opportunity to come by specifically Piers Dawes comments.

**Proposed Response**

PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

---

**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:** Clause, Subclause, page, line

---

**Page 3 of 104**

7/9/2009  1:43:39 PM
There is no harmony and plus there is disconnect between the transmitter jitter and receiver jitter. The transmitter low frequency jitter gets tracked by the 4 MHz CRU defined in CL85 and 86 but the receiver jitter tolerance does not include the tracked jitter, this is called double dipping!

**Suggested Remedy**

We have to test transmitter with a CRU with BW X and then receiver jitter tolerance SJ mask must include same SJ with BW X. High corner frequency could be a problem with some of the digital CDR/EQ and I am assuming this is the reason jitter tolerance is missing, as compromise we can use 1 or 2 MHz for the transmitter CRU BW to measure jitter.

If the CRU BW in CL 83A/B need to also be in Sync if the BW.

See ghiasi_02_0790

**Proposed Response**  
**Response Status** W

PROPOSED REJECT.

The commenter has not provided a sufficiently complete proposal that would enable the implementation of suggested remedy; for committee discussion, see ghiasi_02_0709.pdf.

Clause 85 started without being well thought and with very aggressive cable reach 10m, which is not feasible based on KR. Here are major issue with CL85 specificaitons:

A- PCB loss of 2.3 dB from TP0 to TP1 and TP4 to TP5

B- Reduction of KR ILD by 3 dB and increasing cable IL is not supported with cable return loss specificaitons and stacked connectors

C- Reference 10 m QSFP cable used for baaseline simualtion has 10 dB better return loss than cable SDDxx return loss

D- Reference 10 m QSFP cable with lowest loss was used for the cable loss specificaitons

E- Worst case FEXT are either not included or omitted from CR4/CR10 specifications

**Suggested Remedy**

Here are suggested resolution:

A- Increase PCB loss to 5 dB from 2.3 dB

B- Do not change KR ILD and make max cable IL the same as KR

C- Propose to use CL86 SDDii EQ 86A-1 and SCC22 EQ 86-A2 or stay with current RL and cut the cable reach more

D- Worst case cable pair has 23.7 dB loss or about 2.27 dB/m

D- Include worst case FEXT for QSFP and CXP

With above changes the cable reach is assuming KR loss 23.3= 2.27*X + 1 dB (2 connectors) 10 dB (2x PCB trace), which result with reach of 5.4 m.

See ghiasi_01_0709

**Proposed Response**  
**Response Status** W

PROPOSED ACCEPT IN PRINCIPLE.

Use PCB loss per resolution to comment #96

Consider other changes B and C on the basis of A.
Draft 2.1 Comments  
IEEE P802.3ba D2.1 40Gb/s and 100Gb/s Ethernet comments  
Working Group ballot

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<td>Broadcom</td>
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**Comment Type** TR  **Comment Status** D

Clause 85 and 86 have the same physical instantiation but max transmitter amplitude CL85 1200 mV Table 86-4 exceed the max transmitter amplitude 700 mV for CL86 table 86A-1. There is absolutely no reason to have two electrical level in same physical instantiation with 70% more amplitude in era of energy efficient Ethernet.

**Suggested Remedy**
Reduce CL85 transmitter output from 1200 mV to 700 mV make a seamless interface with out possibly damaging optical modules with over voltage. Reducing voltage to 700 mV is more compatible with 40nm and 32 nm CMOS.

**Proposed Response**
PROPOSED REJECT.

The max transmitter amplitude specified in Clause 85 is consistent with baseline objective to utilize 10GBASE-KR (Clause 72) to specify 40GBASE-CR4 and 100GBASE-CR10.

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<tr>
<td>Booth, Brad</td>
<td>AMCC</td>
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**Comment Type** TR  **Comment Status** D

IEEE P802.3ba has selected nomenclature that conflicts with previous uses of the same nomenclature letter. There has been an effort in the past decade to establish a consistent use of letters for port type nomenclature. Unfortunately, this was not noticed until the task force was in working group ballot.

IEEE P802.3ba should strive to keep its nomenclature consistent with IEEE Std. 802.3-2008. Maintaining a consistency will easily permit additional PMD types to be added to the 40GbE and 100GbE family.

See booth_01_0709.pdf for more information on nomenclature.

**Suggested Remedy**
In all uses of SR, change from short reach to be short wavelength.

In all uses of LR, change from long reach to be long wavelength.

In all uses of ER, change ER to be HR, and change from extended reach to be high-power long wavelength.

**Proposed Response**
PROPOSED REJECT.

The nomenclature was adopted by the Task Force in May 2008 (see motion #2). The adopted nomenclature was presented to the WG by the TF Chair during Jul’08 opening plenary.

The nomenclature was discussed in the task force which also included 802.3 WG members. The requirement for 802.3ba was to distinguish reach for different PMDs, and previous distinctions based on wavelength was not considered sufficient. Hence the current nomenclature was adopted. The nomenclature is also documented clearly in Clause 80.

The task force did discuss the consistency issue; during the discussions it was pointed out that the base document already uses same letter(s) to identify different characteristics. (e.g., B, L, S). Also in the base document numeric suffix identifies either number of lanes/wavelengths or distance. After considerable discussion there was consensus in the Task Force to adopt S, L and E to represent reach.

Also see comment #97.

Discuss in BRC. Hear supporting presentations.
Cl 00 SC 0 P 1 L 20 # 164
Ghiasi, Ali
Broadcom

Comment Type TR
Comment Status D

KR does not close the 10 m link! Clause 85 has fundamental issues which I have raised with my comment against D2.0 and D1.2 but the fundamental issue not addressed. CL85 is about 1 year behind other clause by my estimate.

Suggested Remedy
I propose to spin CL85/86 into a new project

PROPOSED REJECT.

The suggested remedy is not in the ballot scope which is to comment against the entire P802.3ba/D2.1 draft.

Cl 00 SC 45 P 38 L 37 # 355
Grow, Robert
Intel

Comment Type TR
Comment Status D

As specified, edits from P802.3av could be lost. The content of the table on the row for bit 1.12 is being modified by P802.3av, and the content isn’t "Reserved for 802.3av". You should use base text from 802.3av in this case.

Suggested Remedy
Change 1.12 row to the contents of P802.3av (nothing underscore), and correct the Change instruction to "Change indicated rows of Table 45-3 (P802.3av/D3.4)". Delete table row at line 40 as it is an 802.3-2008 row as it is being changed by P802.3av and doesn’t need to be changed again.

PROPOSED ACCEPT IN PRINCIPLE.

Also see related comment #356 regarding changing editing instruction with respect to amended text in 802.3av.

Change 1.12 row to the contents of P802.3av (nothing underscore).

Correct the Change instruction to "Change indicated rows of Table 45-3 (as modified by 802.3av)". Delete table row at line 40 as it is an 802.3-2008 row as it is being changed by P802.3av and doesn’t need to be changed again.

Cl 01 SC 1.1.3.2 P 24 L 22 # 248
Szczepanek, Andre
HSZ Consulting Ltd

Comment Type ER
Comment Status D

Actually they need to be inserted in alphanumeric order.

Suggested Remedy
Change alphabetic to alphanumeric.

PROPOSED ACCEPT.
Comment Type: T  Comment Status: D

For dated references, only the edition cited applies, although we do state that users are encouraged to investigate the possibility of applying the most recent edition. For undated references, the latest edition of the referenced document (including any amendments or corrigenda) applies.

In the Normative references subclause IEC 60793-1-42 is dated referencing the 2007 edition yet in the body of the draft, in subclause 87.8.6.2 Channel requirements the reference to IEC 60793-1-42 undated.

The same is true for IEC 60793-2-50, IEC 61280-1-1, IEC 61280-1-4, G.694.1, G.694.2, G.694.2, G.959.1 and TIA-455-127-A.

Suggested Remedy
- Clarify is a dated or undated reference is intended.

Proposed Response  Response Status: W
PROPOSED ACCEPT IN PRINCIPLE.

Discuss in BRC and if appropriate update with dated or undated references.

Comment Type: ER  Comment Status: D

There are some inconsistencies between nomenclature between this section and the rest of 802.3. In clause 1.4.41 of 802.3-2008, it says "S" is for short wavelength optics while it says short reach in definition in 1.4 and no mention of S in 80.1.4.

The document should be consistent throughout regarding nomenclature if possible and should show some examples of the nomenclature.

Suggested Remedy
- Use consistent nomenclature/definitions in the document. Add a graphic in 80.1.4 to show how the the media notation works. I will make a presentation on this and submit it to the group. Even if we can't use common terminology for the whole document, we should do it in ba.

Proposed Response  Response Status: W
PROPOSED REJECT.

See response to comment #255

The nomenclature is defined in 80.1.4

Discuss in BRC
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<tr>
<td>Excessive capitalization (IEEE style uses lower case, only with justified exceptions for defined terms that otherwise would be confused, e.g., Idle being something distinct on the MII from the generic usage of idle). (Just following what was done in 802.3ae doesn't make it right.)</td>
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<td><strong>Suggested Remedy</strong></td>
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<tr>
<td>Though out of scope recommend:</td>
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<tr>
<td>AUI is attachment unit interface and MII is media independent interface, unfortunately all subsequent xAUIs and xMIIs use title case, consider correcting this generation, you are defining enough interfaces to change the preponderance</td>
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<td>DIC is my fault, the one expansion in the base document should not have been capitalized. Also correct p.149, l.48.</td>
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<tr>
<td>HCB, LSB, MCB, MSB, OTN, OPU3 have no need to use capitalization, search document for expansion and make consistently lower case.</td>
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<td>PROPOSED REJECT.</td>
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<td>The BRC discussed the capitalization issue in 1.5 w.r.t. IEEE style guide during response to comment #668 in D2.0. The consensus decision was to leave it capitalized for LSB, MSB and other definitions.</td>
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<td>P 31</td>
<td>L 45</td>
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<td>While the right thing was done to recognize that other amendments will likely beat this one to publication, best practice is to include detailed insertion point to aid publication editor merge, and not enough detail is provided on many insert instructions.</td>
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<tr>
<td>30.3.2.1.2 -- Since list seems to be in alphnumeric order, instruct &quot;Insert new PHY types in alphanumeric order...&quot;</td>
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| 30.3.2.1.3 -- Same change, "Insert new PHY types in alphanumeric order..."
| 30.5.1.1.2 -- "Insert new PHY types into "APPROPRIATE SYNTAX" before 802.9a (P802.3av/D3.4); change "BEHAVIOR" of 30.5.1.1.2."
| **Proposed Response** |
| **Response Status** W |
| PROPOSED ACCEPT. |

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<td>The or then 'and' construct could be misunderstood.</td>
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**Proposed Response**
PROPOSED ACCEPT IN PRINCIPLE.

In addition to 4.4.2, make the suggested change to Annex 4A (4A.4.2).
IEEE Std 802.3-2008 subclause 30.1.4 "Management model" states that "... items are defined in terms of the template requirements of ISO/IEC 10165-4: 1991." In ISO/IEC 10165-4, under the Attribute template in subclause 8.7.3.2 'WITH ATTRIBUTE SYNTAX type-reference', it is stated that 'This construct, present only if the DERIVED FROM construct is absent, identifies the ASN.1 data type that describes how instances of this attribute are carried in protocol'.

We should therefore be using ASN.1 notation in APPROPRIATE SYNTAX, and I believe that the correct ASN.1 notation for an array is 'SEQUENCE'. For an existing example see subclause 30.3.1.30 'aCollisionFrames'.

Further we need to define a

**SuggestedRemedy**

Suggest that the text 'Array of generalized nonresetable ..' be changed to read 'A SEQUENCE of generalized nonresetable ..'.

Make the same change for subclause 30.5.1.1.16, page 34, line 49.

**Proposed Response**  
PROPOSED ACCEPT.

The counter increment rate needs to be added for 40Gb/s and 100 Gb/s operation.

**SuggestedRemedy**

Add the counter increment rate for 40Gb/s and 100 Gb/s operation.

Make the same change for subclause 30.5.1.1.16, page 34, line 51.

**Proposed Response**  
PROPOSED ACCEPT IN PRINCIPLE.

Change "and 5 000 000 counts per second for 10 Gb/s implementations"

"to 5 000 000 counts per second for 10 Gb/s and 40Gb/s implementations, and 2 500 000 counts per second for 100Gb/s implementations"
Comment Type: T
Comment Status: D

LP coefficient update, LP status, LD coefficient update and LD status should be grouped and not interleaved. Current interleaving increases MDIO interactions when reading the registers.

Suggested Remedy:
Remove interleaving.

Proposed Response:
PROPOSED ACCEPT.

Comment Type: TR
Comment Status: D

Table can be made simpler to read.
Also, the changes to the table may imply that a 10GBASE-R device is required to have the lane 0 copies.

Suggested Remedy:
Change BASE-R FEC ability and BASE-R FEC control to just be FEC ability and Fec control, respectively.
Change register 1.172-1.175 back to being just 10GBASE-R registers. Add a note to the descriptions that in 40G and 100G, implementers may reflect a copy of the information contained in lane 0.
Eliminate references that may imply existing 10G devices would be required to create a "copy" in another register location.
Change BASE-R FEC corrected to be 40G/100G FEC corrected from lane 0-19 in register space 1.176-215.
Change BASE-R FEC uncorrected (lanes 1-19) to be 40G/100G FEC uncorrected from lane 0-19 in register space 1.216-255.

Proposed Response:
PROPOSED ACCEPT IN PRINCIPLE.

Itemizing the comment into 5 paragraphs:

1. The "BASE-R" descriptor is required to distinguish from 10P/2B FEC.
2. Change register 1.172-1.175 back to being just 10GBASE-R registers (no changes to register & subclause names). Delete the (added) first sentence and last sentences of the first paragraph of 45.2.1.86 & 45.2.1.87. Change the additional paragraph for both subclauses:
"For a multi-lane PHY, this register may be a copy of register 1.176 (1.216) BASE-R FEC corrected (uncorrected) blocks counter, lane 0. If implemented, all accesses to the copy shall have identical behavior as the original register."
3. The changes described in 2. eliminate any such implication.
4. & 5. Accept the proposed changes.
<table>
<thead>
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<th>CI</th>
<th>SC</th>
<th>45.2.1.4</th>
<th>P</th>
<th>42</th>
<th>L</th>
<th>47</th>
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<td>E</td>
<td>Comment Status</td>
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<td>These inserts are not in logical order. (We typically define our bits starting with Bit 0 but describe the bits starting from the highest numbered defined bit (with the possible exception of P802.3ap). Consequently newly defined bits require a new 45.x.x.x.1 and renumbering of other bit subclauses. While 45.1.4.8 is serendipitously the correct next subclause number (since P802.3av/D3.4 renumbers the current 45.2.1.4.6 to be 45.2.1.4.7), that puts the bit definitions of bits 8 and 9 after bit 0 and if followed as a precedent would place the bits in what would appear to most readers as random order.</td>
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<tr>
<td>Suggested Remedy</td>
<td>Insert at beginning of 45.2.1.4 and renumber as required. (And, no reference to the most recent amendment is required in this case.) Search for similar occurrences and correct as needed.</td>
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<tr>
<td>Change clause numbers from &quot;45.2.1.4.8 and 45.2.1.4.9&quot; to &quot;45.2.1.4.1a and 45.2.1.4.1b&quot;</td>
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<td>Update change instruction to read: &quot;Insert 45.2.1.4.1a and 45.2.1.4.1b before 45.2.1.4.1 as follows:&quot;</td>
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<td>Comment Status</td>
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<td>As shown, edits from 802.3av could be lost. Change base text to 802.3av.</td>
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<td>Suggested Remedy</td>
<td>Correct instruction on p.42, l.44 to read: Change Table 45-6 as follows (P802.3av/D3.4): Correct first line of your Table 45-6 so that it is strikethrough text of &quot;1.4.15:8&quot;. Delet row for bit 1.4.7 because it is defined in P802.3av/D3.4.</td>
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<td>&quot;Change Table 45-6 (as modified by 802.3av) for 40 Gb/s and 100 Gb/s speed ability:&quot;</td>
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<tr>
<td>Correct first line of your Table 45-6 so that it is strikethrough text of &quot;1.4.15:8&quot;. Delete row for bit 1.4.7 because it is defined in P802.3av/D3.4.</td>
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</table>
Cl 45  SC 45.2.1.89  P 58  L 52  # 354  
Grow, Robert Intel
Comment Type  T  Comment Status  D
With all the gearboxes doesn't this need to be more specific than multi-LAN PHYs (though there is probably only one place in the architecture where the lanes get 20 wide) and only for 40 and 100 Gb/s operation, not for 10 Gb/s operation? It is less certain for the narrower interfaces.

Suggested Remedy
Include text describing where lane 0 is specified "For multi-lane BASE-R PHYs, the even-numbered registers in this set are defined similarly to register 1.174 (see 45.2.1.87) which is used for lane 0, but for lanes 1 through 19 respectively. The odd-numbered registers in this set are defined similarly to work with register 1.175 (see 45.2.1.87) expanding the capability for lanes 1 through 19 respectively. Registers corresponding to lanes that are not used for the implemented PHY shall return all zeros."

Appropriately modify if determined to be appropriate to better specify where within the PHY it becomes this wide.

Make corresponding clarifications for other register descriptions expanding capability for multi-lane PHYs.

Proposed Response  
Response Status  W
PROPOSED ACCEPT IN PRINCIPLE.

Cl 45  SC 45.2.1.95  P 61  L 5  # 355  
Grow, Robert Intel
Comment Type  ER  Comment Status  D
Strange order, inserted clause specify Register 1.307, then 1.309, then 1.308.

Suggested Remedy
Correct order moving 309 after 308.

Proposed Response  
Response Status  W
PROPOSED ACCEPT.

Cl 45  SC 45.2.3  P 64  L 21  # 106  
Young, George AT&T
Comment Type  T  Comment Status  D
Table 45-82 Register name entries for register addresses 3.32, 3.33, 3.42 and 3.43 continue to employ "10G/40G/100G.." nomenclature which was previously removed from the corresponding text in subclauses 45.2.3.11, 45.2.3.12, 45.2.3.15 and 45.2.3.16, respectively.

Suggested Remedy
Remove four instances of "10G/40G/100G" in Table 45-82 register name entries.

Proposed Response  
Response Status  W
PROPOSED ACCEPT.

Cl 45  SC 45.2.3.12  P 68  L 35  # 108  
Young, George AT&T
Comment Type  T  Comment Status  D
Definition of block_lock variable needs added reference to Clause 82 PCS.

Suggested Remedy
Change "This bit is a direct reflection of the state of the hi_ber variable in the 64B/66B state diagram and is defined in 49.2.13.2.2." to:

"This bit is a direct reflection of the state of the hi_ber variable in the 64B/66B state diagram defined in 49.2.13.2.2 for 10GBASE-R and in 82.2.19.2.2 for 40/100GBASE-R."

Proposed Response  
Response Status  W
PROPOSED ACCEPT.
Cl 45  SC 45.2.3.12.4  P69  L 54  # 109
Young, George  AT&T

Comment Type  T  Comment Status  D
Definition of errored_block count variable needs added reference to Clause 82 PCS.

SuggestedRemedy
Change "The errored blocks counter is an eight bit count defined by the errored_block_count counter specified in 49.2.14.2 for 10/40/100GBASE-R ..." to:
"The errored blocks counter is an eight bit count defined by the errored_block_count counter specified in 49.2.14.2 for 10GBASE-R, in 82.3.1 for 40/100GBASE-R ..."

Proposed Response  Response Status  W
PROPOSED ACCEPT.

Cl 45  SC Table 45-11  P47  L 17  # 358
Grow, Robert  Intel

Comment Type  TR  Comment Status  D
P802.3av/D3.4 and P802.3ba/D2.1 both define Bit 1.11.9.

SuggestedRemedy
Correct by modifying editing instruction to reference P802.3av/D3.4, correct first row of indicted changes to edit the reserved row in 802.3av, change second row of to be bit 1.11.10.

Proposed Response  Response Status  W
PROPOSED ACCEPT.

Cl 45  SC Table 45-64a.  P60  L 23  # 249
Szczepanek, Andre  HSZ Consulting Ltd

Comment Type  ER  Comment Status  D
During comment resolution on Draft2.0 it was agreed that PRBS9 checking would be removed to resolve my comment on the lack of a defined implementation for the PRBS9 checker.
The text in Table 45-64a for 1.307.5 and in 45.2.1.94 for 1.307.5 do not reflect the removal of PRBS9 checking.

SuggestedRemedy
In the table description column for 1.307.5 change to:
1 = PRBS9 pattern generation supported
0 = PRBS9 pattern generation not supported

Change text on line 46 to
"and register 1.307, bit 5 indicates that the device supports PRBS9 generation. In both cases, if " (ie remove "or generation"

Proposed Response  Response Status  W
PROPOSED ACCEPT.
Table 45-7

The way it is specified, changes from P802.3av could be lost. Changes need to be marked against P802.3av/D3.4. It is unlikely at this point that additional PHY types will be added by P802.3av consequently, the 40 Gb/s code points could also be moved to start at 011011. The unused bits are simply "Reserved", not reserved for a specific project. (The problem being that if the specified project doesn't use them, are they still Reserved or can they now be used for private usage?)

**Suggested Remedy**

Modify the editing instruction on p.43, l.21 to read: "Change indicated rows of Table 45-7 as follows (P802.3av/D3.4):", and get the change instruction closer to the Table (anchor or float problem).

Line 5 as a modification to P802.3av/D3.4 have strikethrough bit number "1.7.15:5".

Line 18 is wrong, and needs to be replaced with the Table 45-7 code points defined in P802.3av/D3.4 (no longer underscored).

Recommend moving 40 Gb/s code points to start with 011011, and starting 100Gb/s code points at 1000000 (leaving 011111 Reserved and available for the rumored 40 Gb/s serial PMA/PMD type). (If 40 Gb/s code points are not moved, the rows indicating "Reserved" would also be copied from P802.3av/D3.4). Change 100 Gb/s code points to start at 100000.

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE.

"Change Table 45-7 (as modified by 802.3av) for 40 Gb/s and 100 Gb/s PMA/PMD type selections:"

Make Table 45-7 an active link.

Line 5, make strikethrough text "1.7.15:5".

Line 8, make strikethrough text "1.7.4:0".

Column for bit 4 is not underlined.

Replace line 18:

(0 1 x x x x = Reserved for 802.3av)

1 1 1 x x = reserved
1 1 0 1 1 = reserved
1 1 0 1 0 = 10GBASE-PR-U3
1 1 0 0 1 = 10GBASE-PR-U1
1 1 0 0 0 = 10/1GBASE-PRX-U3

Table 45-8

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

Where is the editing instruction for Table 45-8?*

**Suggested Remedy**

Add editing instruction "Change indicated row of Table 45-8 as follows:". Then you don't need the row with the ellipse.

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE.

There is a change instruction for 45.2.1.7 (that includes Table 45-8).

Change the change instruction to make this explicit:

"Change 45.2.1.7 and change the indicated row of Table 45-8 for naming:"
Correct for likely prior publication of P802.3av.

Delete row 3.74 through 3.89. Last row should become an edit of the last row of P802.3av/D3.4.

Proposed Response

PROPOSED ACCEPT IN PRINCIPLE.

"Change Table 45-82 (as modified by 802.3av) for 40 Gb/s and 100 Gb/s PCS registers:"

Delete row 3.74 through 3.89

Replace with change row:

3.83 through 3.32 767 Reserved

becomes

3.83 through 3.89 Reserved

Modify change instruction by adding "(P802.3av/D3.4)". Change marking to be consistent with that base text. (Especially, include P802.3av/D3.4 specification for the 0010 line.)

Proposed Response

PROPOSED ACCEPT IN PRINCIPLE.

"Change Table 45-83 (as modified by 802.3av) for 40 Gb/s and 100 Gb/s speed selection:"

Line 52:

0 0 1 0 = 10/1 Gb/s

Note also, line 50, the text is changed from:

x x 1 1 = Reserved

Return the previously approved text back to its original form.

Change all architecture diagrams to be consistent with the majority of IEEE Std. 802.3-2008 where the coding scheme is only shown with PCS, not the port type.

Proposed Response

PROPOSED REJECT. Comment 560 against D2.0 was resolved in a full meeting of the task force on the 4th May when anslow_05_0509 was discussed. Comment 560 was given due consideration and the final response represents a consensus view of the meeting rather than the view of any particular editor.

Within 802.3ba Figures 69-1, 84-1, 85-1, 86-1, 87-1 and 88-1 are all consistent in how they represent the stack.

In the existing standard Figures 51-1, 53-1 (LX4) and 54-1 (CX4) use the port type nomenclature with the PCS so there is precedent for doing this. It is the notation that was used in the original Figure 69-1 that was anomalous.
fb is the upper limit for requiring ILD compliance. So between 5.15625 and 6 GHz there can be as much crosstalk as you like. I don’t think practical equalisers can stand this; fb should be little higher than the Nyquist frequency.

**Suggested Remedy**
For 40GBASE-KR4, change 5.15625 GHz to 6 GHz (as in 85.10.8 for CRn).

**Proposed Response**
PROPOSED ACCEPT IN PRINCIPLE.

ILD is already specified out to 6 GHz so there is no need to change Clause 69 for this. It is f2 that is the upper limit for ILD (not fb). f2 is 6 GHz which is slightly above nyquist.

Crosstalk is bounded by ICR, and -KRn and -CRn are both consistent in that they bound crosstalk up to Nyquist. See fb in Table 69B-1 and stated frequency range for Equation 85A-6.

85.10.8 describes the cable assembly rather than the channel.

Add paragraph number 85A.8 to line 23 on page 404

This is a pile on to unsatisfied comment 416 against draft 2.1.

**AN_LINK.indication** is an asynchronous signal that goes from the PCS to the AN function. There has been confusion expressed in the task force about how it should be routed. It does not make sense to route it through the PMA and PMD as this would unnecessarily complicate implementation and the specification as well as potentially adding cost.

It does not do any harm to add text to the spec to say AN_LINK.indication may be implemented as an out-of-band signal when the PCS and AN function are on separate chips.

**Suggested Remedy**
Add sentence at end of 73.9.1:
This primitive is an out-of-band asynchronous signal.

**Proposed Response**
PROPOSED ACCEPT.

**spelling fec_bock_lock**

**Suggested Remedy**
change fec_bock_lock to fec_block_lock

**Proposed Response**
PROPOSED ACCEPT.

**GBd** (twice). Underline "for 10G and 40G; and 5.15625 GBd for 100G.." Remove the second full stop.

**Proposed Response**
PROPOSED ACCEPT.

Page 105, Line 30: delete double period

**Proposed Response**
PROPOSED ACCEPT.
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**Comment **

- **CI 74 SC 74.2 P 105 L 31 # 2**
  - **Marris, Arthur Cadence**
  - **Comment Type** E
  - **Comment Status** D
  - **Suggested Remedy** delete one of them
  - **Proposed Response** PROPOSED ACCEPT.

**Response Status**

- W

**Comment **

- **CI 74 SC 74.7.3 P 112 L 30 # 5**
  - **Marris, Arthur Cadence**
  - **Comment Type** TR
  - **Comment Status** D
  - **Suggested Remedy**
    - delete the last paragraph by adding the appropriate editing instruction and inserting the following struck through text:
    - "The 16-bit data transmitted from the PCS function is encoded by the FEC encoder and sent to the PMA sublayer; similarly, the 16-bit data received from the PMA sublayer is decoded by the FEC decoder. The resulting 64B/66B blocks are sent to the PCS sublayer."
  - **Proposed Response** PROPOSED ACCEPT.

**Response Status**

- W

**Comment **

- **CI 74 SC 74.7.4.5 P 116 L 4 # 4**
  - **Marris, Arthur Cadence**
  - **Comment Type** TR
  - **Comment Status** D
  - **Suggested Remedy**
    - underline
    - or PMA IS_SIGNAL.indication(SIGNAL_OK)
    - and
    - or the PMA IS_UNITDATA_x.indication
    - also scrub clause 74 for other instances such as:
      - page 105, line 30
      - page 109, line 50 'rate'
  - **Proposed Response** PROPOSED ACCEPT.

**Response Status**

- W

---

**Comment **

- **CI 80 SC 80.1.3 P 124 L 27 # 82**
  - **Gustlin, Mark Cisco**
  - **Comment Type** E
  - **Comment Status** D
  - **Suggested Remedy** CGMII = 100 Gb/s MEDIA INDEPENDENT INTERFACE PMA = PHYSICAL MEDIUM ATTACHMENT runs together in figure 80-1.
  - **Proposed Response** PROPOSED ACCEPT.

**Response Status**

- W

**Comment **

- **CI 80 SC 80.1.4 P 125 L 34 # 267**
  - **Trowbridge, Stephen Alcatel-Lucent**
  - **Comment Type** E
  - **Comment Status** D
  - **Suggested Remedy**
    - This may have been discussed before, but as there are no single-lane PMDs, it may be better to describe the terminology in the abstract.
    - **Proposed Response** PROPOSED REJECT.

**Response Status**

- W

This is a repeat of comment #291 in draft 2.0.

This issue and exact phrase was discussed in the BRC during resolution of comment #220 and #291. The consensus was to change to the statement as documented (see response to comment #220/D2.0)
Comment Type: E  Comment Status: D
Choice of wording is inconsistent -
The Media Independent Interface is not intended to be electrically instantiated, rather it can logically connect layers within a device.

Interfaces are physically instantiated, not electrically instantiated

Suggested Remedy:
Change sentence to:
The Media Independent Interface is not intended to be physically instantiated, rather it can logically connect layers within a device.

Proposed Response: PROPOSED ACCEPT.

Comment Type: TR  Comment Status: D
FEC might appear either between the PCS and PMA, or between two PMA sublayers - see figures 83-2 and 83C-2

Suggested Remedy:
Replace "The FEC sublayer can be placed in between the PCS and PMA sublayers ..." with "The FEC sublayer can be placed in between the PCS and PMA sublayers or between two PMA sublayers ..."

Proposed Response: PROPOSED ACCEPT.

Comment Type: T  Comment Status: D
The MDIO is optional

Suggested Remedy:
Replace "The MDIO/MDC management interface (Clause 45) provides ..." with "The MDIO/MDC management interface (Clause 45) optionally provides ..."

Proposed Response: PROPOSED ACCEPT IN PRINCIPLE.

Proposed Response: PROPOSED ACCEPT IN PRINCIPLE.

Comment Type: TR  Comment Status: D
The delay constraint on MAC Control/MAC/RS for 40G is still needlessly tight. The increase from 10 pause quanta to 20 pause quanta falls short of what is needed. A delay constraint of 32 pause quanta will allow a broader range of implementations, without causing any harm. The primary value of the delay constraint is to bound the reaction time to a received PAUSE frame. Bounding the delay helps limit the size of receive buffers. An unbounded delay would result in an unbounded buffer size. However, the biggest component of the delay is the round trip propagation delay of the link. The round trip propagation delay of a 10 km optical link at 40G dwarfs the 40G component delay constraints in table 80-1.

Suggested Remedy:
increase the MAC Control/MAC/RS delay constraint for 40G to 32 pause quanta.

Proposed Response: PROPOSED ACCEPT IN PRINCIPLE.

Also see comment #275.

Discuss in BRC. Hear supporting presentation by Howard.
### IEEE P802.3ba D2.1 40Gb/s and 100Gb/s Ethernet comments

<table>
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<td>P 128</td>
<td>L 17</td>
<td># 266</td>
<td>Trowbridge, Stephen</td>
<td>Alcatel-Lucent</td>
<td>Comment Type: E Comment Status: D</td>
<td>Should the &quot;n&quot;s as well as the &quot;x&quot;s be italicized? I think other clauses do this.</td>
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<td>Suggested Remedy: italicize the lower case &quot;n&quot;s (multiple occurrences)</td>
<td>Proposed Response: PROPOSED REJECT.</td>
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<td>Variables should be in italics.</td>
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<td>In this case &quot;x&quot; is a variable that takes a the value from 0 to n-1, where n is the number of streams of data units which is constant for that instance.</td>
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<td>L 33</td>
<td># 361</td>
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<td>Fix typo: line 33: between</td>
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<td>L 46</td>
<td># 6</td>
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<td>Cadence</td>
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<td>Suggested Remedy: change &quot;The XLGMI and the CGMII is&quot; to &quot;The XLGMI/CGMII is&quot;</td>
<td>Proposed Response: PROPOSED ACCEPT IN PRINCIPLE. See the resolution to comment #408</td>
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<td>P 139</td>
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<td>UNH - IOL</td>
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<td>Suggested Remedy: Change &quot;The XLGMI and the CGMII is an optional logical interface&quot; to &quot;The XLGMI and the CGMII are optional logical interfaces&quot;</td>
<td>Proposed Response: PROPOSED ACCEPT.</td>
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<tr>
<td>CI 81</td>
<td>SC 81.1.4</td>
<td>P 140</td>
<td>L 38</td>
<td># 299</td>
<td>Dawe, Piers</td>
<td>Avago Technologies</td>
<td>Comment Type: T Comment Status: D</td>
<td></td>
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<td></td>
<td>Suggested Remedy: Four lines already given in 80.4. This long justification should not be repeated for each sublayer because a sublayer by itself cannot control MAC-to-MAC delay. See another comment addressing 87.3.1 and 88.3.1.</td>
<td>Proposed Response: PROPOSED ACCEPT IN PRINCIPLE.</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:** Clause, Subclause, page, line
Cl 81 SC 81.1.4 P 140 L 52 # 275
Frazier, Howard Broadcom Corporation

Comment Type TR Comment Status D
The delay constraint on MAC Control/MAC/RS for 40G is still needlessly tight. The increase from 10 pause quanta to 20 pause quanta falls short of what is needed. A delay constraint of 32 pause quanta will allow a broader range of implementations, without causing any harm.

The primary value of the delay constraint is to bound the reaction time to a received PAUSE frame. Bounding the delay helps limit the size of receive buffers. An unbounded delay would result in an unbounded buffer size. However, the biggest component of the delay is the round trip propagation delay of the link. The round trip propagation delay of a 10 km optical link at 40G dwarfs the 40G component delay constraints in table 81-1.

Suggested Remedy
increase the MAC Control/MAC/RS delay constraint for 40G to 32 pause quanta.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
Howard will give a short presentation to justify this change.

Cl 81 SC 81.2.3 P 146 L 16 # 300
D'Ambrosia, John Force10 Networks

Comment Type E Comment Status D
unnecessary wording
The data <data> in a well-formed frame shall consist of a set of data octets.

Suggested Remedy
change to
The data <data> in a frame shall consist of a set of data octets.

Proposed Response Response Status W
PROPOSED ACCEPT.
I'm sure I remember as similar discussion during 10Gb/s - but why when we say that the both TXC<7:0> (page 147, line 8) and TXD<63:0> are 'shall transition synchronously with respect to the rising edge of TX_CLK.' why in Figure 81-5 are they shown to transition synchronously with respect to the falling edge of TX_CLK. Is this showing the clock to output delay - but should it be shown as exactly half a clock cycle.

**Suggested Remedy**
Change if thought necessary.

PROPOSED ACCEPT IN PRINCIPLE.
Shift transitions in figures 81-5, 81-6, 81-7 and 81-8, closer to the rising edge.

---

In table 81-4 above RXC = 1 and TXD = 0xFE is described as 'Receive error' yet on this line it is called 'Error control character'.

**Suggested Remedy**
Suggest that ‘.. or Error control characters.’ be changed to read ‘.. or Receive error characters.’.

PROPOSED ACCEPT IN PRINCIPLE.
Change the entry in table 81-4: from: "Receive error" to: "Error"

This makes it consistent with line 49, and makes it consistent with Table 81-3 also.

---

The text ‘.. preserve the column alignment of the transmitting RS ..’ is the first use of the term column in the draft. I don’t see column defined in the definitions of the base IEEE Std 802.3-2008 or being added by this draft.

To add to the confusion is its use in Table 81-5 where it is stated that ‘Values in Lane 1-7 columns are in hexadecimal ..’. What is defined as a column is actually illustrated in a row in the table.

**Suggested Remedy**
Add a definition of column before its use.

PROPOSED ACCEPT IN PRINCIPLE.
Change:
The PCS is required to either preserve the column alignment of the transmitting RS, or align the Start control character to lane 0. The RS shall not indicate DATA_VALID to the MAC for a Start control character received on any other lane. Error free operation will not change the SFD alignment in lane 7. A MAC/RS implementation is not required to process a packet that has an SFD in a position other than lane 7 of the column containing the Start control character.

To:
The PCS is required to either preserve the column alignment of the transmitting RS, or align the Start control character to lane 0. The RS shall not indicate DATA_VALID to the MAC for a Start control character received on any other lane. Error free operation will not change the SFD alignment in lane 7. A MAC/RS implementation is not required to process a packet that has an SFD in a position other than lane 7 XGMII/CGMII transfer containing the Start control character.

In table 81-5:
Change:
NOTE-Values in Lane 1-7 columns are in hexadecimal, most significant bit to least significant bit (i.e., <7:0>).

To:
NOTE-Values are in hexadecimal, most significant bit to least significant bit (i.e., <7:0>).

Add the following after the first paragraph of 81.3.4:
Clause 46 uses the term column when describing data transfer on the XGMII. The eight lanes of data and control transferred per clock cycle on XGMII/CGMII are equivalent to a column in the following description of link fault signaling.
Cl 81 SC 81.3.4 P 154 L 21 # 404
Law, David 3Com

Comment Type T
Comment Status D

To totally avoid any little endian vs big endian confusion suggest that 'upper four bytes' be changed to read 'lane 4 to 7'.

Suggested Remedy
See comment.

Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 81 SC 81.4.3.2 P 158 L 49 # 409
Estes, Dave UNH - IOL

Comment Type E
Comment Status D

Typos

Suggested Remedy
Change "Mapping RXD to PLS_DATA.indicates" to "Mapping RXD to PLS_DATA.indications" and "Create PLS_DATA.increments" to "Create PLS_DATA.indications".

Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 81 SC 81.4.3.4 P 160 L 29 # 410
Estes, Dave UNH - IOL

Comment Type T
Comment Status D

The transition between clock sources is not specified

Suggested Remedy
Remove the PICS statement for the transition between clock sources

Proposed Response Response Status W
PROPOSED ACCEPT.
This was originally classified as E, changed it to T.
### Comment Type: T
### Comment Status: D
We now have two error counting mechanisms that can be used on 64B/66B-like signals: errored blocks and BIP errors. For isolated errors at error rates of interest, they will give near-identical results. If burst errors are involved, the errored block counter will typically count 1 per burst while the BIP error counters will typically count the number of errors in the burst.

It would be useful to be clearer which is meant by BER. As MTTFPA is so important and burst errors are a threat to it, BIP counting seems preferable. Also, it is preferable to be able to count errors the same way with live traffic as with the normative scrambled idle test pattern.

**Suggested Remedy**

Say that BER for 64B/66B signals is defined by BIP error counting. Consider removing (for 40G/100G) or making optional the block error counter mechanism and the errored blocks counters.

**Proposed Response**

**Response Status: W**

PROPOSED REJECT.

The BIP error counting could be used for driving the high BER SM, but currently block errors are a threat to it, BIP counting seems preferable. A complete proposal needs to be made to change to BIP vs. sync errors. A new state machine would need to be designed.

### Comment Type: E
### Comment Status: D
I belive that the PCS is sublayer of the Physical layer - see Figure 82-1.

**Suggested Remedy**

Suggest that 'The 40GBASE-R PCS can connect to one of the following Physical Layers ..' be changed to read 'The 40GBASE-R is a sublayer of the following Physical Layers ..'.

**Proposed Response**

**Response Status: W**

PROPOSED ACCEPT IN PRINCIPLE.

Change:

"Data striping is introduced to support multiple lanes in the Physical Layer" to:

"Data striping is introduced to support multiple lanes on the medium"

From:

"In addition to 64B/66B encoding is a methodology to add alignment markers and distribute data to multiple lanes in order to support PMAs and PMDs with multiple lanes."

To:

"In addition to 64B/66B encoding is a methodology to add alignment markers and distribute data to multiple lanes."
Comment Type E Comment Status D
Suggest that ‘.. Ethernet MAC and reconciliation layers, ..’ should read ‘.. Ethernet MAC and reconciliation sublayers, ..’ as both are sublayers (see Figure 82-1).

Suggested Remedy
See comment.

Proposed Response Response Status W
PROPOSED ACCEPT.

Comment Type TR Comment Status D
The following statement is implementation dependent

"The lower interface of the PCS connects to the PMA sublayer to support a PMD. If the optional FEC sublayer is implemented (see Clause 74), then the lower interface connects to the FEC sublayer."

In the case that an optional FEC sublayer existed, but was connected to the PCS sublayer through a nAUI, then the lower interface of the PCS would still connect to the PMA sublayer.

Suggested Remedy
Change noted text above to

"The lower interface of the PCS connects to the PMA sublayer to support a PMD. If the optional FEC sublayer is implemented (see Clause 74) and an optional physical instantiation, i.e. nAUI, is not implemented, then the lower interface connects to the FEC sublayer."

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

Comment Type T Comment Status D
There is redundancy in the descriptions of the inter-sublayer interfaces and 82.1.4 reads awkwardly

Suggested Remedy
Delete the first paragraph of 82.1.4

Move 82.2.1 to be under 82.1.4 and renumber to 82.1.4.1

Renumber 82.1.5 to 82.1.4.2

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

Comment Type TR Comment Status D
BIP errors should be counted like SDH RS-B1 rather than MS-B1 so that the error count will not be skewed in the case where 40GBASE-R is transported over OTN with transcoding and bit errors in the sync header or control block types cause replacement of an entire 66B block with an error control block. A supporting presentation will be provided.

This falls under the OTN support objective.

Suggested Remedy
Replace "... the appropriate BIP error counter register is incremented for each BIP bit in error (registers 3.90 through 3.99)" with

"... the appropriate BIP error counter register is incremented for each 8-bit BIP value in error (registers 3.90 through 3.99)"

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

We need to discuss this change during the task force to get consensus.

Comment Type T Comment Status D
I don't think the PCS client can be anything other than the RS.

Suggested Remedy
Change the text ‘A PCS client is generally the Reconciliation Sublayer,’ to red ‘The PCS client is the Reconciliation Sublayer.’

Proposed Response Response Status W
PROPOSED ACCEPT.
Comment Type: T  Comment Status: D

Create a variable called r_block_type_next that contains the value of R_TYPE_NEXT

Suggested Remedy:

Add:

r_block_type_next

This variable contains the rx_coded<65:0> vector classification results, returned by the R_TYPE or R_TYPE_NEXT functions. It can assume one of the following five values {C,S,T,D,E}, as defined by the R_TYPE function.

Comment Type: T  Comment Status: D

Change:

r_block_type

This variable contains the rx_coded<65:0> vector classification results, returned by the R_TYPE function. It can assume one of the following five values {C,S,T,D,E}, as defined by the R_TYPE function.

To:

r_block_type_next

This variable contains the rx_coded<65:0> vector classification results, returned by the R_TYPE or R_TYPE_NEXT function. It can assume one of the following five values {C,S,T,D,E}, as defined by the R_TYPE function.

Comment Type: E  Comment Status: D

Old function definition

Suggested Remedy:

Remove the definition of T_BLOCK_TYPE because it has been replaced with T_TYPE.

Proposed Response: Response Status: W

PROPOSED ACCEPT.

Comment Status: D

Add:

r_block_type_next

This variable contains the rx_coded<65:0> vector classification results, returned by the R_TYPE or R_TYPE_NEXT function. It can assume one of the following five values {C,S,T,D,E}, as defined by the R_TYPE function.

Comment Type: TR  Comment Status: D

Function T_BLOCK_TYPE no longer exists.

Proposed Response: Response Status: W

DELETE T_BLOCK_TYPE.

Comment Status: D

Add:

r_block_type_next

This variable contains the rx_coded<65:0> vector classification results, returned by the R_TYPE or R_TYPE_NEXT function. It can assume one of the following five values {C,S,T,D,E}, as defined by the R_TYPE function.

Comment Type: E

"T_TYPE = tx_raw<71:0>" should be "T_TYPE(tx_raw<71:0>)"

Suggested Remedy:

"T_TYPE = tx_raw<71:0>" should be "T_TYPE(tx_raw<71:0>)"

Proposed Response: Response Status: W

PROPOSED ACCEPT IN PRINCIPLE.

Change to:

T_TYPE(tx_raw<71:0>)
Draft 2.1 Comments

IEEE P802.3ba D2.1 40Gb/s and 100Gb/s Ethernet comments

Cl  82  SC 82.2.19.2.4  P 183  L 37  # 19
Muller, Shimon  Sun Microsystems, Inc

Comment Type E  Comment Status D
Plural.

SuggestedRemedy
Replace *marker* with *markers*.

Proposed Response  Response Status W
PROPOSED ACCEPT.

Cl  82  SC 82.2.19.3  P 184  L 36  # 201
D’Ambrosio, John  Force10 Networks

Comment Type E  Comment Status D
Transmit state diagram text / reference is prior to the Receive state diagram text, yet the Transmit State Diagram Fig 82-15 is after the Receive State Diagram Fig 82-14.

SuggestedRemedy
Reorder figures so that Transmit State Diagram is before Receive State Diagram

Proposed Response  Response Status W
PROPOSED ACCEPT.

Cl  82  SC 82.2.2  P 165  L 54  # 301
D’Ambrosio, John  Force10 Networks

Comment Type E  Comment Status D
Should be definitive as to who many streams for each rate
When communicating with the PMA, the PCS uses multiple serial streams, either 4 or 20 encoded bit streams depending on the PCS6.
Furthermore, this is a general issue throughout clause 82, where references are made to 4 "x" or 20 "x", but not in relation to the speed being run.

SuggestedRemedy
change wording to
When communicating with the PMA, the PCS uses multiple serial streams, 4 encoded bit streams for 40GBASE-R or 20 encoded bit streams for 100GBASE-R.

Proposed Response  Response Status W
PROPOSED ACCEPT.
Comment Type ER Comment Status D
"When the receive channel is in normal mode ..."
This simplifies that deskew is not required when the receiver is in test pattern mode, which is not the case.
The only PCS testpattern is scrambled idles which requires all the synchronization steps listed in this paragraph.

Suggested Remedy
"When the receive channel is in normal or testpattern mode ..."

Proposed Response Response Status W
PROPOSED ACCEPT.

Comment Type E Comment Status D
Typo.

Suggested Remedy
Change '0x1e' to read '0x1E'.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

Comment Type E Comment Status D
Function names have changed

Suggested Remedy
Change R_BLOCK_TYPE to R_TYPE and T_BLOCK_TYPE to T_TYPE

Proposed Response Response Status W
PROPOSED ACCEPT.
Cl 82 SC 82.2.4.2 P 168 L 27 # 417
Estes, Dave
UNH - IOL
Comment Type T Comment Status D
There is a PICS but no shall
SuggestedRemedy
Change "Block bit transmission order is illustrated" to "Block bit transmission order shall be as illustrated"
Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 82 SC 82.2.4.3 P 168 L 42 # 10
Marris, Arthur
Cadence
Comment Type T Comment Status D
'Each control block contains eight characters.' Is this really true?
SuggestedRemedy
Preferably delete the sentence:
'Each control block contains eight characters.'
or change to
Each control block encodes eight characters.
Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
Change to:
Each control block encodes eight characters.

Cl 82 SC 82.2.4.3 P 171 L 1 # 414
Estes, Dave
UNH - IOL
Comment Type T Comment Status D
Unused values of block type are defined twice.
SuggestedRemedy
Change "All unused values of block type field are reserved" to "All unused values of block type field are invalid" to match the new wording in 82.2.4.5.
Proposed Response Response Status W
PROPOSED ACCEPT.
Comment Type: T  Comment Status: D
There isn't a shall or PICS associated with alignment markers

Suggested Remedy
- Add a shall statement and a PICS statement for the insertion of alignment markers.

Proposed Response  Response Status: W
PROPOSED ACCEPT IN PRINCIPLE.
Change: "The alignment markers are inserted after every 16383 66-bit blocks on each PCS lane"
To: "The alignment markers shall be inserted after every 16383 66-bit blocks on each PCS lane"
And add appropriate PICS.
Change from: "The content of the alignment markers is shown in Table 82-2 for 100GBASE-R and in Table 82-3 for 40GBASE-R."
To: "The content of the alignment markers shall be as shown in Table 82-2 for 100GBASE-R and in Table 82-3 for 40GBASE-R."
And add appropriate PICS.

Comment Type: E  Comment Status: D
Style guide says to avoid "will" (although I think we use it in a particular formula of words in Clause 30), and this use in an example may be fine.

Suggested Remedy
- Check style guide. Can change "will contain" to "contains".

Proposed Response  Response Status: W
PROPOSED ACCEPT IN PRINCIPLE.
Change to "contains"
Cl 82 SC 82.7 P 194 L 1 # 416
Estes, Dave
UNH - IOL
Comment Type T Comment Status D
PICS are needed for several shalls
SuggestedRemedy
PICS are needed for the following shalls:
82.2.4.3 page 171 line 1 (2 shall statements)
82.2.4.4 page 172 line 1 (2 shall statements)
82.2.4.6 page 172 line 19 (Idles shall not be added during data)
82.2.19.2.3 AM_SLIP, DECODE, ENCODE, and SLIP contain shall statements
82.2.19.3 No PICS statement for Figure 82-12 PCS deskew state diagram

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
Review all of these shalls and agree that PICS are required in the TF.

Cl 82 SC 82.7.4.1 P 195 L 34 # 381
Gustlin, Mark
Cisco
Comment Type T Comment Status D
PICS C4 no longer makes sense, this was left over from 10G.
SuggestedRemedy
Delete PICS C4. Clause 81 states that the minimum IPG for the RS can be as low as one byte (just a /T/) so all of the idle can be deleted.
Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 82 SC 82.7.6.1 P 197 L 6 # 381
Ganga, Ilango
Intel
Comment Type TR Comment Status D
The PICS for state machines should include separate line items for 40GBASE-R and 100GBASE-R to match the requirements of 82.2.19.3. Where there is difference in requirements for 40GBASE-R and 100GBASE-R then these should be captured as separate line items in 82.2.19.3 and in PICS.

Also the PCS deskew process requirements depicted in figure 82-12 is a requirement for 40GBASE-R and 100GBASE-R. So change line 25 to shall statement(s) to capture this requirement and add a corresponding PICS.

The BER process requirements are different for 40GBASE-R and 100GBASE-R. Change line 31 to "shall" statements to capture this requirement (500us window and 1.25ms window).

PCS_R_Status (page 197, line 18) appears to be a carry over from Clause 49. This signal is not used in Clause 82. So delete this PICS SM6.

SuggestedRemedy
Change PICS as follows:
Item: Feature Value/Comment
SM1: 40GBASE-R PCS lane lock. Implements 4 PCS lane lock process as depicted in Figure 82-10
SM2: 100GBASE-R PCS lane lock. Implements 20 PCS lane lock process as depicted in Figures 82-10
SM3: 40GBASE-R PCS alignment marker lock Implements 4 alignment marker lock process as depicted in Figure 82-11
SM4: 100GBASE-R PCS alignment marker lock Implements 20 alignment marker lock as depicted in Figure 82-11
SM5: 40GBASE-R and 100GBASE-R PCS deskew. Meets the requirements of Figure 82-12

Also change 82.2.19.3 line 25 to include "shall" to capture the deskew requirement.

SM6: 40GBASE-R BER monitor. Meets the requirement of Fig 82-12 with xus_timer_done equals 1.25ms
SM7: 40GBASE-R BER monitor. Meets the requirement of Fig 82-12 with xus_timer_done equals 500us.

Also change 82.2.19.3 line 31 to include shall statements to capture the difference in xus_timer requirement for 40GBASE-R and 100GBASE-R

Change/renumber Transmit and Receive PICS as follows
SM8 40GBASE-R and 100GBASE-R Transmit process
SM9 40GBASE-R and 100GBASE-R Receive process

Delete PCS_R_Status from 82.7.6.1 (SM6) as this is not defined or used in Clause 82.
<table>
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<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
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<tbody>
<tr>
<td>83</td>
<td>83.1.1</td>
<td>199</td>
<td>12</td>
<td>379</td>
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<td>T</td>
<td>D</td>
<td>PROPOSED ACCEPT.</td>
<td>W</td>
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<td></td>
<td>Ganga, Ilango</td>
<td>T</td>
<td>D</td>
<td>Avoid listing of PMDs in the PMA clause that will create a maintenance issue in future. So rephrase sentence as suggested.</td>
<td>PROPOSED ACCEPT IN PRINCIPLE.</td>
</tr>
<tr>
<td></td>
<td>83.1.1</td>
<td>199</td>
<td>22</td>
<td>380</td>
<td>Intel</td>
<td>T</td>
<td>D</td>
<td>The 40GBASE-R PMA(s) can support any of the 40 Gb/s PMDs as specified in Table 80-1. The 100GBASE-R PMA(s) can support any of the 100 Gb/s PMDs as specified in Table 80-1.</td>
<td>PROPOSED ACCEPT.</td>
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<td></td>
<td>Ganga, Ilango</td>
<td>T</td>
<td>D</td>
<td>&quot;The 40GBASE-R PMA(s) can support any of the following PMDs: 40GBASE-SR4, 40GBASE-LR4, 40GBASE-CR4, or 40GBASE-KR4. The 100GBASE-R PMA(s) can support any of the following PMDs: 100GBASE-SR10, 100GBASE-LR4, 100GBASE-ER4, or 100GBASE-CR10.&quot;</td>
<td>PROPOSED ACCEPT IN PRINCIPLE.</td>
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<td>Ganga, Ilango</td>
<td>T</td>
<td>D</td>
<td>&quot;The 40GBASE-R PMA(s) can support any of the 40 Gb/s PMDs listed in Table 80-1. The 100GBASE-R PMA(s) can support any of the 100 Gb/s PMDs listed in Table 80-1.</td>
<td>PROPOSED ACCEPT.</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>Ganga, Ilango</td>
<td>T</td>
<td>D</td>
<td>Change physical description of PMD service interface to include XLPPI/CPPI as suggested.</td>
<td>PROPOSED ACCEPT.</td>
</tr>
</tbody>
</table>

Suggested Remedy

The purpose of the PMA is to adapt the PCS Lanes (PCSL) to an appropriate number of abstract or physical lanes and to optionally provide test signals and loopback.

PROPOSED ACCEPT IN PRINCIPLE.

Replace "The electrical PMD service interfaces for 40GBASE-SR4 and 100GBASE-SR10 PMDs are defined in Annex 86A." with "The purpose of the PMA is to adapt the PCS Lanes (PCSLs) to an appropriate number of abstract or physical lanes and to optionally provide test signals and loopback."
The text in section 83.1.4 reads:

"Each PMA remaps the PCSLs from m PMA input lanes to n PMA output lanes in the Tx direction, and from n PMA input lanes to m PMA output lanes in the Rx direction."

Later in the clause, the PMA bit muxes are described as having "m input lanes" and "n output lanes" and the mux is used in both the TX and RX directions.

Then, even later in the clause, figure 83.5 uses "p" to refer to the number of lanes on the side of the PMA closest to the MAC and "q" to refer to the number of lanes closest to the PMD.

The use of "m" and "n" in 83.1.4 seems inconsistent since it implies that "m" and "n" exist on specific sides of the PMA, where in our current scheme, they are always the inputs and outputs of a direction agnostic bit mux.

**Suggested Remedy**

Change 83.1.4 to read:

Each PMA remaps the PCSLs from p PMA input lanes to q PMA output lanes in the TX direction and from q PMA input lanes to p PMA output lanes in the RX direction.

**Proposed Response**

PROPOSED ACCEPT.

---

The generic interface is now called inter-sublayer service interface defined in 80.3, so rephrase as suggested

**Suggested Remedy**

Rephrase item (a) as follows:

a) The inter-sublayer service interface defined in 80.3, is used for the PMA, FEC and PMD service interfaces supporting a flexible architecture with optional FEC and multiple PMA sublayers

Rephrase item (c) as follows

c) The abstract inter-sublayer service interface can be physically instantiated as a XLAUI or CAUI, using associated PMAs to map to the appropriate number of lanes.

**Proposed Response**

PROPOSED ACCEPT.
Comment Type: E Comment Status: D

Style.

Suggested Remedy
"See 83.5.2 for more details Figure 83-4."
with
"For more details see 83.5.2 and Figure 83-4."

PROPOSED ACCEPT IN PRINCIPLE.

Overtaken by comment 366

Comment Type: E Comment Status: D

Sentence fragment. Rephrase as suggested

Suggested Remedy
See 83.5.2 and Figure 83-4 for details.

Also add missing cross-reference to 83.5.2

Also rephrase line 35 as follows:
Figure 83-5 provides the functional block diagram of a PMA.

PROPOSED ACCEPT.

Comment Type: ER Comment Status: D

Add a sentence to indicate SIGNAL_OK parameter can take a value of OK or FAIL. Also specify the condition when this parameter takes a value of OK and under what condition this parameter takes a value of FAIL. (alternatively define this condition in 83.5.7 Link Status subclause and refer to it in 83.3).

Indicate the validity of the PMA:IS_UNIDATA_x.indication when the PMA:IS_SIGNAL.indication primitive indicates FAIL in 83.3.

Suggested Remedy
As per comment

PROPOSED ACCEPT IN PRINCIPLE.

Replace
"When these conditions are met, PMA:IS_SIGNAL.indication (SIGNAL_OK) is sent to the PMA client." with
"When these conditions are met, the SIGNAL_OK parameter sent to the PMA client via the PMA:IS_SIGNAL.indication primitive will have the value OK. Otherwise, the SIGNAL_OK parameter will have the value FAIL."

Comment Type: E Comment Status: D

Typo: change "promitives" to "primitives"

Suggested Remedy
As per comment

PROPOSED ACCEPT.
PMA test patterns (optional)

PRBS31 generation and checking in the 100BASE-LR4/ER4 PMA is a requirement to allow implementation of the 100BASE-LR4/ER4 optical tests using standard (BERT) test equipment.

Suggested Remedy

Reword as PRBS31 generation and checking is mandatory for 100BASE-LR4/ER4 PMAs.

PROPOSED REJECT.

It has been confirmed through several meeting cycles that test patterns are optional, adding further clarification of this in sub-clause headers, PICS, etc.

The PMA receive side PRBS31 checker would be much more useful if it could check a signal that had been through a gearbox, e.g. when testing whole modules or whole gearbox ICs. This is more of a concern for 100G than for 40G.

Also it is desirable to do the same test with the same pattern in module factory, and in host factory, and in service. See dawe_01_0509.pdf and subsequent work.

Note that the change of words below makes no difference to the high speed silicon of e.g. a 40G serial PMA or a 10-lane PMA pattern generator because a PRBS31 when 2-way 4-way bit-demuxed is four PRBS31s (with offsets >31 UI).

So far the analysis shows that interleaved PRBS31s have similar characteristics to single PRBS31s.

Suggested Remedy

Change "on each of the lanes" to "on each of the PCS lanes" here and at line 19.

Change "one lane and any other lane" to "one PCS lane and any other PCS lane"

In the paragraphs beginning line 25 and line 34, change "lane" or "lanes" to "PCS lane" or "PCS lanes".

Delete "Note that bit multiplexing of per-lane PRBS31 may produce a signal which is not meaningful for downstream sublayers."

Provide 20 PRBS31 error counters in each direction, one per PCS lane.

PROPOSED REJECT.

There is no limit to the potential increment rate of the PRBS31 checker referenced in 49.2.12.

The checker implementation is difficult to match at high increment rates or in the presence of burst errors (the source synchronous descrambler implementation error multiplication factor depends on burst pattern).

For most practical purposes stringent matching of the 49.2.12 implementation is not necessary. It would be sufficient to match the result of a 49.2.12 implementation only for isolated single bit errors and at errors rates better than 1 in a thousand.

Suggested Remedy

Replace:

(see 49.2.12)

With:

The PRBS31 checker shall match the results of the checker implementation in 49.1.12 for isolated single bit errors and at errors rates better than 1 in a thousand.

PROPOSED REJECT.

While it is arguable that the existing PRBS31 checker is not ideal, it has stood the test of time for 10G interfaces and it is not compelling to diverge from this for 40/100GBASE-R.

The maximum error count rate for PRBS31 error counting appears not to be specified. It would be too power-hungry to try to count every error.

Suggested Remedy

Define a BER above which the reported count rate may saturate, in the range $10^{-6}$ to $10^{-3}$, for both check Tx PRBS31 and check Rx PRBS31.

PROPOSED REJECT.

There is no such specification in 49.2.12 for 10G, and it does not seem compelling to diverge in the spec for 40/100G. Such limitations would seem to be implementation dependent.
The following requirement is specified in 83.5.2 without a "shall" statement.

The only requirement is that from the time the link is brought up, each PCSL from an input lane is mapped to a particular output lane, and the input lane to output lane mapping of PCSLs is maintained.

Suggested Remedy
Add a "shall" to indicate this requirement and add a corresponding PICS.

"each PCSL from an input lane shall be mapped...shall be maintained"

Proposed Response
PROPOSED ACCEPT IN PRINCIPLE.
Replace "The only requirement is that from the time the link is brought up, each PCSL from an input lane is mapped to a particular output lane, and the input lane to output lane mapping of PCSLs is maintained." with "From the time the link is brought up, the mapping of each PCSL from an input lane to a particular output lane shall be maintained." Add new "LANE_MAPPING" PICS to 83.7.3 table with reference to 83.5.2, mandatory.

Proposed Response
PROPOSED ACCEPT.

To be consistent change "nominal rate R" to "nominal signaling rate R" in two instances (line 6 and line 8).

Suggested Remedy
As per comment

Proposed Response
PROPOSED ACCEPT.

The PMD service interface described is specific to 40GBASE-SR4 and 100GBASE-SR10, so rephrase as suggested

86.2 specifies the PMD service interface for 40GBASE-SR4 and 100GBASE-SR10 PMDs. Annex 86A specifies the Parallel Physical Interface (XLPPI and CPPI), the physical instantiation of the PMD service interface for 40GBASE-SR4 and 100GBASE-SR10.

Proposed Response
PROPOSED ACCEPT.

Include a "shall" statement to capture the PMA link status requirements in 83.5.7. Also add a corresponding PICS to 83.7.3 to capture this requirement

Suggested Remedy
Change 83.5.7 line 8 as follows:
The PMA shall provide link status information to the PMA client using the PMA-IS_SIGNAL.indication primitive

Insert the following PICS to 83.7.3

Proposed Response
PROPOSED ACCEPT.
Cl 83  SC 83.5.7  P 210  L 8  # 320

D'Ambrosia, John  Force10 Networks

Comment Type  TR  Comment Status  D
Comment: Link Status does not have a corresponding SHALL statement or PIC.

Suggested Remedy
The PMA provides link status information to the PMA client using the PMA:IS_SIGNAL.indication primitive.

The PMA shall provide link status information to the PMA client, as described in this subclause (83.5.7), using the PMA:IS_SIGNAL.indication primitive.

Add PIC
PROPOSED ACCEPT IN PRINCIPLE.

Dup 383.

Cl 83  SC 83.6.  P 212  L 17  # 384

Ganga, Ilango  Intel

Comment Type  TR  Comment Status  D
The PMA control variables should be defined in Clause 83. If MDIO is implemented then these PMA control variables shall map to the MDIO control variables as shown in Tables 83-2 and 83-3. Since MDIO is optional the control and status variables should still be defined in PMA clause that will be used to control and monitor the status of the PMA sublayer. Also the error counters should be defined in Clause 83 that will map to the MDIO registers. See Clause 74 in the base document as reference for defining counters/variables.

Modify the corresponding subclauses to define these variables.
Add PICS as appropriate. See 74.11.4 as an example for implementing management PCIS.

Suggested Remedy
Define control/status variables and add to last column of Table 83-2 as follows. Also define these variables in appropriate subclauses where these functions are described:

Remote_loopback_enable; Add to Table 83-2 and describe this variable in last paragraph of 83.5.9
Local_loopback_enable; Add to Table 83-2 and describe this variable in last paragraph of 83.5.8
PRBS31_enable; Add to Table 83-2
PRBS9_enable; Add to Table 83-2
Tx_PRBS_gen_enable; Add to Table 83-2
Tx_PRBS_checker_enable; Add to Table 83-2
Square_wav_enable_0 to Square_wav_enable_9; Add to Table 83-2
Change description in 83.5.10 to include the above control variables instead of directly writing to the register bits. Since implementing MDIO is optional, the operation should be described without dependency to these MDIO register bits.
Add the following variables to Table 83-3. Define the variables in corresponding subclauses where the function is described.
Remote_loopback_ability;
Local_loopback_ability;
PRBS_pattern_ability;
PRBS31_pattern_ability;
PRBS9_pattern_ability;
PRBS_Tx_gen_ability;
PRBS_Tx_checker_ability;
PRBS_Rx_gen_ability;
PRBS_Rx_checker_ability;
Square_wav_ability

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: Clause, Subclause, page, line

Cl 83  Page 36 of 104  7/9/2009  1:43:40 PM
SC 83.6.
The error counters are now combined in status variable mapping. Instead move these counters to a separate table 83-4 as follows:

Table 83-4 MDIO/PMA counters mapping

Define the following error counters in 83.5.10 and add to Table 83-4:
Ln0_PRBS_Tx_pattern_test_err_counter to Ln9_PRBS_Tx_pattern_test_err_counter;
Ln0_PRBS_Rx_pattern_test_err_counter to Ln9_PRBS_Rx_pattern_test_err_counter;

These variables and counters need to be implemented in PMA sublayer even if MDIO is not implemented, so add corresponding management PICS to Clause 83.

Add subclause 83.7.7 Management
Add PICS corresponding to the above management variables/counters

PROPOSED ACCEPT IN PRINCIPLE.

---

Comment Type: TR  Comment Status: D

There should be separate PICS to capture the local and remote loopback requirements in 83.5.8 and 83.5.9.

Also the PICS in 83.7.6 that captures the optional requirements should be updated accordingly.

SuggestedRemedy
Change 83.7.3 LB as follows:

<table>
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<th>Value/Comment</th>
<th>Status</th>
<th>Support</th>
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<td>83.5.8</td>
<td></td>
<td>Yes/No/NA</td>
</tr>
<tr>
<td>LBR PMA Remote loopback</td>
<td>83.8.9</td>
<td></td>
<td>Yes/No/NA</td>
</tr>
</tbody>
</table>

Change 83.7.6 LB1 and LB2 as follows:

| LB1 PMA local loopback implemented | 83.5.8 | Meets the requirements of 83.5.8 |
| LB1:Y Yes/No |

| LB2 PMA remote loopback implemented | 83.5.9 | Meets the requirements of 83.5.9 |
| LB2:Y Yes/No |

PROPOSED ACCEPT.

---

Comment Type: TR  Comment Status: D

All parameters listed in Table 83A-1 are normative and have a corresponding "SHALL" statement in the text following the table except "Maximum Termination Mismatch at 1MHz".

SuggestedRemedy
Add following sentence to end of paragraph at 83A.3.3.3

The maximum termination mismatch at 1 MHz shall be less than the requirement defined in Table 83A-1.

PROPOSED ACCEPT.
It would be helpful to begin the overview with a statement that using nAUI is optional. This also occurs in 83B. See Annex 86A for reference.

**Suggested Remedy**

Add as the first sentence to the overview, "The XLAUI/CAUI interfaces are optional instantiations of the interface between PMA sublayer of Clause 83." Repeat with appropriate adjustment for 83B.

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE.

Optional is currently stated in the first sentence for both 83A and 83B:

This annex defines the functional and electrical characteristics for the optional 40 Gb/s Attachment Unit Interface (XLAUI) and 100 Gb/s Attachment Unit Interface (CAUI).

This annex defines the functional and electrical characteristics for the optional chip-to-module 40 Gb/s Attachment Unit Interface (XLAUI) and 100 Gb/s Attachment Unit Interface (CAUI).

---

The text refers to a transmit pin but the drawing, Fig 83A-2, uses the term Transmitter. It's also unlikely that pins are used in actual packages. This also occurs with the Rx text in 83A.2.2.

**Suggested Remedy**

Make the terms consistent between Figure 83A-2 and the text in 83A.2.1 and 83A.2.2. Change pin to contact.

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE.

change 83A.2.1 to:

...between the Transmitter and the Transmit Compliance Point shall be

change 83A.3.1

...between the Receiver and the Receive Compliance Point shall be less than CPIMax
Comment Type ER Comment Status D

Figure 83A-3 is titled, "Insertion loss between Transmit Compliance Point and Transmit Compliance Pin". The | at the end is likely inadvertent. Is compliance defined for the pins (preferably contacts)? If not they should not be called compliance pins. This also occurs in 83A.2.2 for the Rx.

Suggested Remedy
For Figure 83A-3 change "Insertion loss between Transmit Compliance Point and Transmit Compliance Pin" to "Insertion loss between Transmit Compliance Point and Transmitter Contact" and for Figure 83A-4 change "Insertion loss between Receive Compliance Point and Receive Compliance Pin" to "Insertion loss between Receive Compliance Point and Receiver Contact". In the text change 'transmit pin' to 'transmitter contact' and 'receive pin' to 'receiver contact'.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Change Figure 83A-3 title to:
Insertion loss between Transmit Compliance Point and Transmitter

Change Figure 83A-4 title to:
Insertion loss between Receive Compliance Point and Receiver

Comment Type ER Comment Status D

In Table 83A-1, the parameter name 'Single-ended output voltage range' should be 'Single-ended output voltage'.

Suggested Remedy
In Table 83A-1, change the parameter name from 'Single-ended output voltage range' to 'Single-ended output voltage'.

Proposed Response Response Status W

PROPOSED ACCEPT.
Change Table 83A-1:
Single-ended output voltage range to
Single-ended output voltage

Proposed Response Response Status W

PROPOSED ACCEPT.

The following table entries in Table 83A-1 do not match their respective subclause headings:
Differential Output S-parameter > 83A.3.3 Differential output return loss
Common Mode Output S-parameter > 83A.3.4 Common mode output return loss

Suggested Remedy
change table entry "Differential Output S-parameter" to "Differential output return loss"
change table entry "Common Mode Output S-parameter" to "Common mode output return loss"

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Change Table 83A-1:
change table entry "Differential Output S-parameter" to "Differential output return loss"
change table entry "Common Mode Output S-parameter" to "Common mode output return loss"

Comment Type E Comment Status D

In Table 83A-1, the parameters named, 'Transmitter eye mask definition' seem better named 'Transmitter eye mask coordinate'. This also occurs in Table 83A-2.

Suggested Remedy
In Table 83A-1, change the parameters names from, 'Transmitter eye mask definition' to 'Transmitter eye mask coordinate'. Repeat in Table 83A-2.

Proposed Response Response Status W

PROPOSED REJECT.

Transmitter eye mask definition is consistent with other clauses (52, 86, 87, 88)
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
SORT ORDER: Clause, Subclause, page, line

Draft 2.1 Comments

IEEE P802.3ba D2.1 40Gb/s and 100Gb/s Ethernet comments

Working Group ballot

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</tr>
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Ghiasi, Ali  Broadcom

Comment Type: TR  Comment Status: D

Maximum rise and fall time

Suggested Remedy

Should be min rise and fall time

Proposed Response

Response Status: W

PROPOSED REJECT.

Minimum rise / fall time and maximum rise / fall time appears to be referenced correctly.
See below for reference.

Minimum Output Rise and Fall time (20% to 80%) 24 ps

83A.3.3.2 Rise/fall time

Differential rise/fall times shall be greater than the minimum output rise and fall time defined in Table 83A-1, as measured from the 20% to the 80% levels. Shorter transitions may result in excessive high-frequency components and increase EMI and crosstalk. The upper limit is defined by the transmit eye mask shown in Figure 83A-8. Rise/fall time is measured with de-emphasis off.

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Petrella, John  Avago Technologies

Comment Type: T  Comment Status: D

Clause 83A.5.1 defines an off state for de-emphasis as the optimal setting for jitter and eye mask testing. This definition may allow some small level of de-emphasis in the off state. Should equation 83A-3 that that into consideration?

Suggested Remedy

Add a term to Eq 83A-3 to subtract cut off-state de-emphasis.

Proposed Response

Response Status: W

PROPOSED REJECT.

The optimal setting for jitter should result in an immaterial amount of de-emphasis (otherwise this will add jitter). Therefore subtraction is not necessary.

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D'Ambrosia, John  Force10 Networks

Comment Type: ER  Comment Status: D

Reference is to wrong figure. Fig 83a-3 is for insertion loss.

Suggested Remedy

Change reference from Fig 83a-3 to Fig 83A-5

Proposed Response

Response Status: W

PROPOSED ACCEPT.

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<td>512</td>
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</table>

D'Ambrosia, John  Force10 Networks

Comment Type: TR  Comment Status: D

In cases where the rise and fall time are very different the equation 83A-6 over estimates the min Vtx-demph

Suggested Remedy

Propose to use geometric average of tr/ff = SQRT(Tr*Ts), instead of max rise and fall time

When tr and fall time were different the far end eye opening for compliant transmitter was more than 110 mV, see ghiasi_03_0709

Proposed Response

Response Status: W

PROPOSED ACCEPT IN PRINCIPLE.

Add equation to section 83A.3.3.1

\[ x = (Tr*Ts)^{0.5} \]

where Tr is Rise time in ps, Ts is Fall time in ps

Make similar change to equation 83B-5

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</table>

D'Ambrosia, John  Force10 Networks

Comment Type: ER  Comment Status: D

Reference is to wrong figure. Fig 83a-3 is for insertion loss.

Suggested Remedy

Change reference from Fig 83a-3 to Fig 83A-5

Proposed Response

Response Status: W

PROPOSED ACCEPT.

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D'Ambrosia, John  Force10 Networks

Comment Type: ER  Comment Status: D

Reference is to wrong figure. Fig 83a-3 is for insertion loss.

Suggested Remedy

Change reference from Fig 83a-3 to Fig 83A-5

Proposed Response

Response Status: W

PROPOSED ACCEPT.

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D'Ambrosia, John  Force10 Networks

Comment Type: ER  Comment Status: D

Reference is to wrong figure. Fig 83a-3 is for insertion loss.

Suggested Remedy

Change reference from Fig 83a-3 to Fig 83A-5

Proposed Response

Response Status: W

PROPOSED ACCEPT.

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D'Ambrosia, John  Force10 Networks

Comment Type: ER  Comment Status: D

Reference is to wrong figure. Fig 83a-3 is for insertion loss.

Suggested Remedy

Change reference from Fig 83a-3 to Fig 83A-5

Proposed Response

Response Status: W

PROPOSED ACCEPT.

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D'Ambrosia, John  Force10 Networks

Comment Type: ER  Comment Status: D

Reference is to wrong figure. Fig 83a-3 is for insertion loss.

Suggested Remedy

Change reference from Fig 83a-3 to Fig 83A-5

Proposed Response

Response Status: W

PROPOSED ACCEPT.

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D'Ambrosia, John  Force10 Networks

Comment Type: ER  Comment Status: D

Reference is to wrong figure. Fig 83a-3 is for insertion loss.

Suggested Remedy

Change reference from Fig 83a-3 to Fig 83A-5

Proposed Response

Response Status: W

PROPOSED ACCEPT.

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D'Ambrosia, John  Force10 Networks

Comment Type: ER  Comment Status: D

Reference is to wrong figure. Fig 83a-3 is for insertion loss.

Suggested Remedy

Change reference from Fig 83a-3 to Fig 83A-5

Proposed Response

Response Status: W

PROPOSED ACCEPT.

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D'Ambrosia, John  Force10 Networks

Comment Type: ER  Comment Status: D

Reference is to wrong figure. Fig 83a-3 is for insertion loss.

Suggested Remedy

Change reference from Fig 83a-3 to Fig 83A-5

Proposed Response

Response Status: W

PROPOSED ACCEPT.
No pattern is defined for rise and fall time measurement.

Suggested Remedy:
Propose to use pattern of 8 1's and 8 0's for rise and fall time measurements.

 Proposed Response
Add the following sentence to 83A.3.3.2:
Rise/Fall time measurements are taken using an average of at least 16 waveforms and taken at the center of the respective UI using a squarewave test pattern as defined in 83A.5.10.

Comment Status: D
Response Status: W
Ghiasi, Ali Broadcom

Comment Type: TR
Comment Status: D
Draft says abs(SCC22) <= 9 dB. SCC22 is a common mode output reflection response, so it must be less than 1 W/W, or 0 dB. If the common mode output reflection response at a particular frequency were 0.1 + 0.076i, the absolute response (without phase) would be sqrt(0.1^2 + 0.076^2) = 0.1259 W/W, or -9 dB. Not plus.

By comparison, the things called loss in Clause 85 actually are loss, hence positive. The mathematics police pick on things like this.

CAUTION: S-PARAMETERS ARE A MEASURE OF GAIN (OUTPUT REFERRED TO INPUT) BY DEFINITION. HOWEVER COMMON USAGE HAS INCORRECTLY IMPLEMENTED THE WORD 'LOSS' INSTEAD OF GAIN. PARAMETERS WHOSE AMPLITUDE IS EXPRESSED AS A NEGATIVE DB VALUE REPRESENT A GAIN LESS THAN ONE OR A POSITIVE 'LOSS'. PLEASE EXERCISE CAUTION IN THIS AREA AND UNDERSTAND THAT DATA MAY BE PRESENTED OR LABELED INCORRECTLY (i.e., GAINS BEING LABELED AS LOSSES).

Suggested Remedy:
Correct the signs of the S-parameters.

 Proposed Response
PROPOSED REJECT.

Using positive loss is consistent with other sections in 802.3

Comment Type: T
Comment Status: D
Since a small (up to 1 dB channel) exist befor you get to Tx compliance point, why do you measure with no emphasis? This seems fair to allow equalization of this small channel for Host Tx measurements. Also in test methods in section 5.1 page 379 line 15.

Suggested Remedy:
Remove line:
Jitter and eye mask measurement requirement are described in 83A.5.1, and are conducted with de-emphasis off.

 Proposed Response
PROPOSED ACCEPT IN PRINCIPLE.

The intent is to ensure that the jitter mask requirements are not measured with significant amounts of de-emphasis since this will cause excessive DJ. Therefore it is specified with De-emphasis off with the description in 83A.5.1 (off is the optimal setting for transmit jitter testing).

There are two references to 83A.5.1. Therefore delete the following sentence from 83A.3.5:
The template measurement requirements are specified in 83A.5.1

Comment Status: D
Response Status: W
Misek, Brian Avago Technologies
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<th>Cl</th>
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<tr>
<td><strong>Table entries in Table 83A-2 need to be corrected and match respective subclauses.</strong></td>
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<tr>
<td>Change Table 83A-2 &quot;differential input s-parameters&quot; to &quot;Differential input return loss&quot;</td>
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<tr>
<td>Change Table 83A-2 &quot;differential common mode input conversion s-parameters&quot; and 83A.3.4.4 &quot;Reflected differential to common mode conversion&quot; to &quot;Differential- to-common mode input return loss&quot;</td>
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<td><strong>PROPOSED ACCEPT IN PRINCIPLE.</strong></td>
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<td>83A</td>
<td>83A.3.4.1</td>
<td>ER</td>
<td>D</td>
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<td>158</td>
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<td>Pettrilla, John</td>
<td>Avago Technologies</td>
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<tr>
<td><strong>Reference is made to a 'reference input signal' defined in 83A.3.4.2' but there's no mention in 83A.3.4.2 of a reference input signal.</strong></td>
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<td><strong>SuggestedRemedy</strong></td>
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<tr>
<td>In 83A.3.4.1 change from 'reference input signal' to 'compliant input signal' and in 83A.3.4.2, change from 'An input signal' to A compliant input signal.</td>
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<td><strong>PROPOSED ACCEPT.</strong></td>
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<td>Avago Technologies</td>
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<tr>
<td><strong>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. This is a jitter accumulation issue.</strong></td>
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<td><strong>SuggestedRemedy</strong></td>
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<tr>
<td>Modify the jitter specifications to be sure they do allow two concatenated CDRs and an optical link, XFP style. Create two masks in figure 83A-12, with 1 MHz corner frequency for a transmit side signal, and the current 4 MHz for a receive side signal.</td>
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<tr>
<td><strong>PROPOSED REJECT.</strong></td>
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<td>Force10 Networks</td>
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<td><strong>Sign of equation for insertion loss is going in the wrong direction.</strong></td>
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<td><strong>SuggestedRemedy</strong></td>
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<td>Reverse the signs for both equations</td>
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<td><strong>PROPOSED ACCEPT.</strong></td>
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**TYPE: TR/technical required ER/editorial required GR/general required**
**COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn**
**SORT ORDER: Clause, Subclause, page, line**
Cl 83A SC 83A.5 P 383 L # 176
Ghiasi, Ali Broadcom

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

**Suggested Remedy**
What is LP

**Proposed Response**
PROPOSED ACCEPT.

---

Cl 83A SC 83A.5.1 P 382 L 13 # 175
Ghiasi, Ali Broadcom

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

**Suggested Remedy**
High pass pole for jitter measurement to harmonize with PPI it may need to change from 4 MHz. Corner frequency for PPI and nAUI has to be the same.

**Proposed Response**
PROPOSED REJECT.

---

Cl 83B SC 83B.1 P 385 L 40 # 525
D'Ambrosia, John Force10 Networks

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

**Suggested Remedy**
Fig 83B-1 calls out connector loss of 0.5dB. This should be consistent with 86A.

Page 424 Line 36: The recommended maximum loss of the host channel (PCB only) at 5.15625 GHz is 3.5 dB.
Observation: 5.3dB - 3.5dB = 1.8dB for HCB + connector
Equation 83A-7 specifies 1.26dB for HCB trace only
Observation: 1.8dB - 1.26dB = 0.54dB for connector only

but
However, specifications for HCB, MCB, and mated HCB/ MCB:
HCB: 1.26dB
MCB: 0.67dB
Mated HCB / MCB: 2.8dB
Connector loss = 2.8 - 1.26 - 0.63 = 0.87dB

**Suggested Remedy**
Resolve what the loss of the connector should be.

**Proposed Response**
PROPOSED ACCEPT IN PRINCIPLE.

Resolution on difference required. Agreed value needed

Change table 83B-1 such that loss is specified at 5.15625 and change the following text to:

The loss budget of Equation 83A-9 is linearly scaled to 7.9 dB loss at 5.15625 GHz for the Host XLAUI / CAUI component, and 2.1 dB loss at 5.15625 GHz for the module as per Table 83B-1 and Equation (83B-1) for the host and Equation (83B-2) for the module.

from:

The loss budget of Equation 83A-9 is linearly scaled to 7.9 dB loss at 5.5 GHz for the Host XLAUI / CAUI component, and 2.1 dB loss at 5.5 GHz for the module as per Table 83B-1 and Equation (83B-1) for the host and Equation (83B-2) for the module.
**Comment Type**: ER  **Comment Status**: D

Figure 83B-1 is similar to Figure 83A-2 but the names on what may be identical items are different, e.g. XLAUI/CAUI Component vs XLAUI/CAUI IC, Driver vs Transmitter, Input vs Receiver. If these block diagram elements are actually the same, please use the same terminology, otherwise it can be confusing. See also Fig 83B-3.

**Suggested Remedy**

If the XLAUI/CAUI Component & XLAUI/CAUI IC are the same use the same name. Likewise for Driver & Transmitter use Transmitter and for Input & Receiver use Receiver.

**Proposed Response**  **Response Status**: W

PROPOSED ACCEPT IN PRINCIPLE.

Change figure 83B-1:
- Change XLAUI/CAUI IC to XLAUI/CAUI Component
- Change Driver to Transmitter
- Change Input to Receiver

---

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

SDD22 for nAUI module output should match the PPI specification.

**Suggested Remedy**

Modify the SDD11 in Table 83B-2 to match the PPI specifications in equation 86A-3 and section 86A.4.2.1

**Proposed Response**  **Response Status**: W

PROPOSED REJECT.

---

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

No definition on the nAUI CDR requirements

**Suggested Remedy**

Please add section similar to XFP+ MSA Rev 4.5 section 3.9.2. To reduce the host burden we may want to consider the max BW here 4 MHz insted of 8 MHz.

**Proposed Response**  **Response Status**: W

PROPOSED REJECT.

See comment 36

---

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

Module compliance is not very descriptive

**Suggested Remedy**

Suggested title, Module Specifications

**Proposed Response**  **Response Status**: W

PROPOSED REJECT.

Since this specification focuses on module compliance and not module specifications, the title is appropriate
**Comment 178**

**Comment Type:** TR  
**Comment Status:** D  
**Suggested Remedy:** Remove HCB  
**Proposed Response:** PROPOSED ACCEPT IN PRINCIPLE.

Modify the following sentence from:

A module which uses XLAUI / CAUI to interface with a host shall meet the characteristics outlined in Table 83B-2 and Table 83B-3 when measured using the MCB and HCB.

to

A module which uses XLAUI / CAUI to interface with a host shall meet the characteristics outlined in Table 83B-2 and Table 83B-3 when measured using the MCB and HCB (where the HCB is used to calibrate inputs to the module).

**Comment 340**

**Comment Type:** TR  
**Comment Status:** D  
**Suggested Remedy:** Modify the SDD11 in Table 83B-2 to match the PPI specifications in equation 86A-1 and section 86A.4.1.1  
**Proposed Response:** PROPOSED REJECT.

SDD11 for nAUI module input should match the PPI specification.

**Comment 341**

**Comment Type:** TR  
**Comment Status:** D  
**Suggested Remedy:** Modify the SDD11 in Table 83B-2 to match the PPI specifications in equation 86A-1 and section 86A.4.1.1  
**Proposed Response:** PROPOSED ACCEPT IN PRINCIPLE.

nAUI modules should have more flexibility with respect to SDD

See comment 341
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: Clause, Subclause, page, line

**Comment 182**

**Comment Type:** TR  
**Comment Status:** D  
Vtx-demph was derived based on assumption of maximum module PCB loss, the impact of module PCB with near zero loss need to be studied and possibly adjust Vtx-demph

**Suggested Remedy:**
Please see ghiasi_03_0709

**Proposed Response:**
PROPOSED ACCEPT IN PRINCIPLE.

Far end jitter compliance is expected with a short channel and appropriate Vtx-demph setting.

**Comment 181**

**Comment Type:** TR  
**Comment Status:** D  
In cases where the rise and fall time are very different the equation 83A-6 over estimates the min Vtx-demph

**Suggested Remedy:**
Propose to use geometric average of \( \frac{tr}{tf} = \sqrt{tr \times tf} \) instead of max rise and fall time  
see ghiasi_03_0709

**Proposed Response:**
PROPOSED ACCEPT IN PRINCIPLE.

See comment 174

**Comment 339**

**Comment Type:** TR  
**Comment Status:** D  
SDD22 for nAUI host output should match the PPI specification.

**Suggested Remedy:**
Modify the SDD22 in Table 83B-4 to match the PPI specifications in equation 86A-1 and section 86A.4.2.1

**Proposed Response:**
PROPOSED REJECT.

See comment 341

nAUI modules should have more flexibility with respect to SDD

**Comment 185**

**Comment Type:** TR  
**Comment Status:** D  
Not the best use of title "Host Compliance"

**Suggested Remedy:**
Host Specifications

**Proposed Response:**
PROPOSED REJECT.

Since we are specifying host compliance, title is appropriate

**Comment 338**

**Comment Type:** TR  
**Comment Status:** D  
SDD11 for nAUI host input should match the PPI specification.

**Suggested Remedy:**
Modify the SDD11 in Table 83B-4 to match the PPI specifications in equation 86A-3 and section 86A.4.2.1

**Proposed Response:**
PROPOSED REJECT.

See comment 341

nAUI modules should have more flexibility with respect to SDD
# IEEE P802.3ба D2.1 40Gb/s and 100Gb/s Ethernet Comments

## Cl 83B  SC 83B.2.2  P 390  L 39  # 186

**Ghiasi, Ali**

**Working Group ballot**

### Comment Status: D/Dispatched

#### Comment Type: TR/Technical Required

**Suggested Remedy:**
- Remove MCB, or if you want to keep MCB then say MCB is used for signal calibration.
- Change the following sentence from:
  
  A host which uses XLAUI / CAUI to interface with a module shall meet the characteristics outlined in Table 83B-4 and 83B-5 when measured using the MCB and HCB.

  to:

  A host which uses XLAUI / CAUI to interface with a module shall meet the characteristics outlined in Table 83B-4 and 83B-5 when measured using the MCB and HCB (where the MCB is used to calibrate inputs to the host).

**Proposed Response:**
- PROPOSED ACCEPT IN PRINCIPLE.

### Cl 83B  SC 83B.2.2  P 390  L 46  # 183

**Ghiasi, Ali**

**Working Group ballot**

### Comment Status: D/Dispatched

#### Comment Type: TR/Technical Required

**Suggested Remedy:**
- Receiver tolerance must include the effect of cascaded CDR's.
- Change the following sentence from:
  
  A host which uses XLAUI / CAUI to interface with a module shall meet the characteristics outlined in Table 83B-4 and 83B-5 when measured using the MCB and HCB.

  to:

  A host which uses XLAUI / CAUI to interface with a module shall meet the characteristics outlined in Table 83B-4 and 83B-5 when measured using the MCB and HCB (where the MCB is used to calibrate inputs to the host).

**Proposed Response:**
- PROPOSED ACCEPT IN PRINCIPLE.

### Cl 83B  SC 83B.2.3  P 390  L 52  # 245

**Misek, Brian**

**Working Group ballot**

### Comment Status: D/Dispatched

#### Comment Type: T/Technical Required

**Suggested Remedy:**
- See ghiasi_03_0709

**Proposed Response:**
- PROPOSED REJECT.

### Cl 83B  SC 83B.2.3  P 390  L 3  # 246

**Misek, Brian**

**Working Group ballot**

### Comment Status: D/Dispatched

#### Comment Type: T/Technical Required

**Suggested Remedy:**
- Rewrite to allow for the eyemask to be measured at appropriate point.

**Proposed Response:**
- PROPOSED REJECT.

83B has been written around the connector compliance point. There should be no need to have a board which represents 7.9dB of channel loss.
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<th>Comment Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
<th>Proposed Response</th>
<th>Response Status</th>
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<td>83B.2.4</td>
<td>391</td>
<td>15</td>
<td>167</td>
<td>TR</td>
<td>D</td>
<td>Host input tolerance signal at MCB output is confusing</td>
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<td></td>
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<tr>
<td>83C</td>
<td>83C.1.1</td>
<td>395</td>
<td>32</td>
<td>514</td>
<td>ER</td>
<td>D</td>
<td>In Fig 83C-1 the PMD Service Interface is called out. This is inconsistent with other figures in the text. This is also done for Fig 83C-3.</td>
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<tr>
<td>83C</td>
<td>83C.1.2</td>
<td>396</td>
<td>1</td>
<td>280</td>
<td>TR</td>
<td>D</td>
<td>In Annex 83C, there is no diagram to show the need of MMD 10.</td>
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<tr>
<td>83C</td>
<td>83C.1.1</td>
<td>232</td>
<td>23</td>
<td>371</td>
<td>E</td>
<td>D</td>
<td>Font size in column 4 is inconsistent with other fonts in table.</td>
<td></td>
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</table>

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

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

Sort Order: Clause, Subclause, page, line

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<th>Proposed Response</th>
<th>Response Status</th>
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<tr>
<td>E</td>
<td>D</td>
<td>SIGNAL_DETECT is defined in 84.7.4. So no need to describe the condition for SIGNAL detect generation in 84.2. Just provide a reference to 84.7.4 and only describe the validity of UNIDATA_x.indication in 84.2.</td>
<td>PROPOSED REJECT.</td>
</tr>
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</table>

### Proposed Response

The current text is OK and consistent with Clause 85 and other Clauses. It does not seem worth the effort and risk of changing it.

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<tbody>
<tr>
<td>TR</td>
<td>D</td>
<td>Exchange of DME frames is an unnecessary burden on the host: it was designed for AN purposes but the other port types that this port could be connected to can't understand it. The choice of link types is 4 x 3.125 lanes (CX4), 4x10G lanes, and 4x10G lanes with FEC, and this can be managed with 'Parallel Detection' not DME frames. In the future, and in closed systems such as a supercomputer, support for legacy CX4 will be unnecessary. Note that 16G Fibre Channel do not use DME frames, although for electrical PMDs they use training. They may use training frames to signal FEC support, although that should not be necessary. DME signalling is not necessary for these copper links, and should not appear on front-panel ports.</td>
<td>PROPOSED REJECT.</td>
</tr>
</tbody>
</table>

### Proposed Response

Add text in Clause 85 saying that 40GBASE-CR4 and 100GBASE-CR10 can use Parallel Detection. Use the same method as 16GFC's link speed negotiation for CX4/CR4 negotiation. This is in line with the backward compatibility with CX4 and baseline "Parallel detection function to detect legacy 10GBASE-CX4 PHYs".

<table>
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<th>Proposed Response</th>
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<tbody>
<tr>
<td>TR</td>
<td>D</td>
<td>Add text in Clause 85 saying that 40GBASE-CR4 and 100GBASE-CR10 can use Parallel Detection. Use the same method as 16GFC's link speed negotiation for CX4/CR4 negotiation. This is in line with the backward compatibility with CX4 and baseline &quot;Parallel detection function to detect legacy 10GBASE-CX4 PHYs&quot;.</td>
<td>PROPOSED REJECT.</td>
</tr>
</tbody>
</table>

### Proposed Response

Suggested remedy inconsistent with baseline objective to utilize 802.3ap electricals and to include backward compatibility with CX4 see diminico_02_0708.pdf. The commenter has not provided a sufficiently complete proposal for replacement of DME frames with a parallel detection mechanism.
The maximum cable loss should be adjusted to allow for a common host PCB design for CR and SR variants.

Suggested Remedy
Reduce the cable loss number to approximately 16.3 dB to allow the equivalent SR PPI PCB loss.

PROPOSED REJECT
Maximum cable assembly loss consistent with baseline objectives of at least 10 m reach constrained by 802.3ap channel insertion loss and Tx/Rx PCB loss.

Max cable loss 21.55 is not the worst case

Increase 21.55 to 23.7 dB which is 2.27 dB/m of loss

PROPOSED REJECT
Maximum cable assembly loss limits based on maximum loss of measured cable assemblies (+5% additional loss). See diminico_02_1108.pdf comment resolution #458 accepted as worse case measured cable assembly. Note 5% loss added to measured cable assembly IL. Measurements consistent with baseline objectives of at least 10 m reach constrained by 802.3ap channel insertion loss and Tx/Rx PCB loss. The Protocol implementation conformance for CR4 and CR10 includes cable assembly specifications that shall be met for implementation of compliant channels.

Reference 10 m QSFP cable with lowest loss was used for the cable loss specifications
Eq 85-50

Worst case cable loss is 2.27 dB/m, ILca becmones
ILca=0.2120239*SQRT(f) + 0.001643*f which has loss of 23.7 dB at Nyquist

PROPOSED REJECT. See remedy comment #201
Comment Type: TR
Comment Status: D
I believe the sum of new cable loss limit plus PCB loss limit exceeds the KR "high confidence" region of 68B. Fixing this may mean adjusting the 10 m objective.

Suggested Remedy
Reduce the cable loss so that cable loss plus PCB losses is within the KR high confidence region.

Proposed Response
PROPOSED REJECT. See remedy comment #201

Comment Type: TR
Comment Status: D
The insertion loss of a cable assembly is not a linear function of frequency so why does it make sense to try to fit it to such a function?

Note that the equation ILC/Amax contains a significant term that is proportional to \( \sqrt{f} \).

Suggested Remedy
Consider basing IL/fitted on a polynomial fit. Refer to healey_03_0709.pdf.

Proposed Response
PROPOSED ACCEPT IN PRINCIPLE. Use polynomial fit for cable assembly IL fit; for committee discussion see healey_03_0709.pdf.

Comment Type: ER
Comment Status: D
Line reads "The ILD shall be within the region defined by Equation (85–47) and Equation (85–48) for all frequencies from 50 MHz to 6000 MHz". This should be from 1000 MHz to 6000 MHz. Loss characteristics are different for cables below 1 GHz and above 1 GHz. Can't use a linear IL fitted line to calculate ILD if the ILD needs to be met below 1 GHz. Also, Figure 85-5 does not reflect the frequency range.

Suggested Remedy
Change lower frequency of ILD requirement back to 1000 MHz as in draft 2.0

Proposed Response
PROPOSED ACCEPT IN PRINCIPLE.
[Editor's note: Late comment submitted after the ballot close; pending consideration by the Task Force]

See remedy to comment #139

Comment Type: TR
Comment Status: D
Reduction of KR ILD by 3 dB Eq 85-57/58 and increasing cable IL is not supported with cable return loss specifications and stacked connectors

Suggested Remedy
Do not change KR ILD and make max cable IL the same as KR

Proposed Response
PROPOSED ACCEPT IN PRINCIPLE.
See ghiasi_01_0709

Comment Type: E
Comment Status: D
caption for Fig 85-5 got separated onto next page away from the figure

Suggested Remedy
keep caption and figure together on same page.

Proposed Response
PROPOSED ACCEPT.
Comment Type: TR

The least mean squares line fit procedure defined by Equation (85-52) through Equation (85-56) needs to be adjusted to better fit the cable assembly insertion loss between the frequency range of 50 MHz to 100 MHz as the error in the fit is an independent source of ILD. This applies to 85A.7 Channel insertion loss deviation (ILD) as well.

Suggested Remedy:
Specify fit procedures to better fit the cable assembly insertion loss (ILD) and the channel insertion loss deviation (ILD) specified in 85A.7 over the frequency range of 50 MHz to 100 MHz.

Presentation material will be provided in support of suggested remedy.

PROPOSED ACCEPT IN PRINCIPLE. see remedy comment #139

Comment Type: T

Cabling RL high. When this is presented to a RL of -15dB for the ASIC host it will cause ripple in the channel that has not been captured in any of the budgets. In order to keep with the higher insertion loss then KR the RL for the cable will need to be reduced.

For 2 networks "a" and "b" that are joined to make Network "c"

1. If one connect two 2-port networks described in terms of S-parameters
   \[ SC21 = SA21*SB21/(1-SA22*SB11) \]
   where (SJUX being complex numbers)

2. For the channels we work with, generally the phases of SA22 and SB11 are not specified or even specifiable. Therefore we can approximate:
   \[ \text{db}(SC21) = \text{db}(SA21)+\text{db}(SB21) + \text{correction}. \]
   The correction amounts to an uncertainty in \text{db}(SC21) which will contribute to ILD, since the phase both SA22 and SB11 will vary quite a bit with frequency.
   \[ |\text{correction}| < 20*log10(|SA22*SB11|) \]
   Worst case the uncertainty will add directly to ILD.
   Some will argue that it should RSS with ILD which might be slightly optimistic

3. Assuming return loss of the channel TP0-TP2 is 12dB at Nyquist and Cable assembly return loss is 5.7dB
   \[ |\text{correction}| < 1.133 \]
   4. Making similar assumptions for TP3-TP5, gives a second correction.
   \[ |\text{correction}| < 1.133 \]
   5. RSSing the 2 corrections with the specified ILD=1.73dB for the Cable assembly at Nyquist gives:
   \[ \text{ILD TP0-TP5} = +/-2.3 \text{ dB} \]

Suggested Remedy:
RL to -9dB at Nyquist to limit the additional channel ripple correction to .5dB and channel ILD impact to less the 0.2dB

PROPOSED ACCEPT IN PRINCIPLE. For committee discussion
Cl  85  SC  85.10.4  P  254  L  4  #  421
Balasubramanian, Vittal  FCI USA, Inc.

Comment Type  ER  Comment Status  D
Figure 85-6 should start from 50 MHz and not 100 MHz

SuggestedRemedy
Change figure per comment

Proposed Response  Response Status  W
PROPOSED ACCEPT.
[Editor's note: Late comment submitted after the ballot close; pending consideration by the Task Force]

Cl  85  SC  85.10.4  P  256  L  20  #  422
Balasubramanian, Vittal  FCI USA, Inc.

Comment Type  TR  Comment Status  D
ICRcaft shall be greater than or equal to ICRcamin as defined by the following equation where f is expressed in GHz.
This statement cannot be true. f needs to be in Hz or eqn 85-60 needs to change to (f/5)

SuggestedRemedy
Change equation per comment

Proposed Response  Response Status  W
PROPOSED ACCEPT IN PRINCIPLE.
[Editor's note: Late comment submitted after the ballot close; pending consideration by the Task Force]

Cl  85  SC  85.10.5  P  262  L  41  #  205
Ghiasi, Ali  Broadcom

Comment Type  TR  Comment Status  D
Needs to be log10

SuggestedRemedy
Replace log with log10

Proposed Response  Response Status  W
PROPOSED ACCEPT.

Cl  85  SC  85.10.5  P  264  L  21  #  203
Ghiasi, Ali  Broadcom

Comment Type  ER  Comment Status  D
Wrong reference

SuggestedRemedy
Replace figure 85-10 with 85-7

Proposed Response  Response Status  W
PROPOSED REJECT.
Can't locate wrong reference.
When worst case FEXT included in the PSXT then cable insertion loss to crosstalk crosses over around 400 MHz.

Suggested Remedy
Specifications is does not close either reduce cable reach to 5 m, define KR+ EQ, allow combination of passive and active cables.

See ghiasi_01_0709

PROPOSED REJECT.

Power sum crosstalk (including FEXT) constrained by insertion loss to crosstalk ratio. Specified ICR based on 0.5 m and 10 m cable assembly measurements consistent with baseline objectives of at least 10 m reach constrained by 802.3ap channel insertion loss and Tx/Rx PCB loss; see diminico_02_1108. The Protocol implementation conformance for CR4 and CR10 includes cable assembly specifications that shall be met for implementation of compliant channel.

PROPOSED REJECT. See remedy comment#170. Please note: In 10m analysis models measured FEXT disturber used for 3 disturber's in power sum crosstalk calculation imposing worse case FEXT.

In 0.5 m analysis model worse case measured FEXT used; see diminico_02_1108.pdf.

The insertion loss to crosstalk ratio limit (ICRCAsin) predicts that compliant cable assemblies will produce larger crosstalk voltages than observed on actual cable assemblies.

It has also been pointed out that the log-linear fit to the measured insertion loss to crosstalk ratio (ICR) sometimes produces limit violations even though the raw data appears to be in the compliance range.

A metric based on a weighted integral of the power sum crosstalk will be less sensitive to the shape of the transfer function and offer a tighter coupling to the receiver interference tolerance test conditions.

Consider specifications based on integrated crosstalk noise. Refer to healey_02_0709.pdf.

PROPOSED REJECT. The commenter has not provided a sufficiently complete proposal that would enable the implementation of suggested remedy; for committee discussion see healey_02_0709.pdf.
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: Clause, Subclause, page, line

Comment Type TR  Comment Status D
Reported in balasubramanian_01_0509.pdf, the equation for generating the fit line for any data to test to the limit line as specified in section 85.10.8 can cause some cable assemblies, which actually pass the ICR requirements in raw data to fail the requirements with the fit line. This applies to 85A.7 Channel insertion loss to crosstalk ratio (ICR).

SuggestedRemedy
Modify specific requirements to reduce false negatives due to fit procedure. This applies to 85A.7 Channel insertion loss to crosstalk ratio (ICR).

Presentation material will be provided in support of suggested remedy.

Proposed Response  Response Status W
PROPOSED ACCEPT IN PRINCIPLE. see response comment#141

Comment Type T  Comment Status D
In Figure 85-8, test points TP1 and TP4 should on the other side of the block labeled "cable assembly test fixture" and not between that block and schematic representation of the connector as shown. If this figure is intended to imply that the cable assembly test fixture should be de-embedded from the measurement, then there really isn’t a need to define the test fixture at all.

Also, the connector receptacle is part of the cable assembly test fixture.

SuggestedRemedy
Change the label on each box to "Cable assembly test fixture excluding connector" and move TP1 and TP4 to the outside edges of the boxes.

Proposed Response  Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

The channel insertion loss is determined by Equation (85-A-3). To reconcile this the test fixture IL is removed from the measurement (IL is the only parameter that is de-embedded).

Step 1. Change the label on each box to "Cable assembly test fixture excluding connector" and move TP1 and TP4 to the outside edges of the boxes.

Step 2. Add text to subclause 85.10.9 "Cable assembly test fixture" indicating that the insertion loss of test fixture is calibrated from the measurement for comparison to the measurement limits determined using Equation (85-40).
Cl 85 SC 85.11 P 258 L 50 # 104
Kipp, Scott Brocade

Comment Type ER Comment Status D
Figure 85-10. The caption of Figure 85-10 is non-descriptive and not consistent with Fig 85-12.

SuggestedRemedy
Change the caption to Example Style 1 cable assembly plug

Proposed Response
PROPOSED ACCEPT.

Cl 85 SC 85.11 P 259 L 11 # 105
Kipp, Scott Brocade

Comment Type ER Comment Status D
The caption of Figure 85-11 is non-descriptive and not consistent with Fig 85-13.

SuggestedRemedy
Change the caption to Example Style 1 MDI board receptacle

Proposed Response
PROPOSED ACCEPT.

Cl 85 SC 85.11 P 259 L 8 # 98
Kipp, Scott Brocade

Comment Type TR Comment Status D
Figure 85-11. This isn't a picture of the QSFP because it only has 26 pins.

SuggestedRemedy
I have the original picture if you want it since I was the editor of QSFP. We have one for QSFP+ also.

Proposed Response
PROPOSED ACCEPT IN PRINCIPLE. Update figure 85-11 with QSFP board receptacle figure.

Cl 85 SC 85.11 P 262 L 12 # 59
Kipp, Scott Brocade

Comment Type ER Comment Status D
Figure 85-14 and 85-15 don’t match Revision 1.77 of SFF-8642. The latest revision of SFF-8642 uses different terminology than this standard. Revision 1.77 uses D1-D21 instead of D64 to D84. Table use

SuggestedRemedy
Please put the latest figures in the document.

Proposed Response
PROPOSED ACCEPT IN PRINCIPLE. Update figures 85-14 and 85-15 per latest revision of SFF-8462.

Cl 85 SC 85.11.1.1.2 P 260 L 27 # 59
Dawe, Piers Avago Technologies

Comment Type TR Comment Status D
Specification of cable at low frequencies still needs fixing; the informative note is nice but we need something normative. If “it's just a wire” then meeting a low frequency spec will be easy. Remember this is not a measurement standard; no-one has to measure something if they can convince the customer that “it’s just a wire” so there isn’t a cost or test-time problem. However, For Style-1 40GBASE-CR4 and 100GBASE-CR10 plug connectors the receive lanes are AC-coupled; the coupling capacitors are contained within the plug connectors. Large customers can avoid the bad cables by experience but this is Ethernet; any cable from Fry’s should work.

SuggestedRemedy
Add a normative specification to 85.10 Cable assembly characteristics to ensure that performance not much worse than the capacitor recommendation is achieved.

Proposed Response
PROPOSED REJECT. This requirement is already embodied in the 85-10 specifications. For Style 1 and CR10 MDI's the cable assembly specifications are to be met with the coupling capacitors contained within the plug connectors.
Cl  85  SC  85.11.1.2  P  260  L  27  #  42
Dawe, Piers  Avago Technologies

Comment Type  TR  Comment Status  D
Specification range for cable insertion loss is not adequate especially at low frequencies. SFP+ Annex E cable S-parameter specs go down to 10 MHz. Even a PRBS9 goes down to 20 MHz. If "it's just a wire" then meeting a spec below 50 MHz will be easy. Remember this is not a measurement standard; no-one has to measure something if they can convince the customer that "it's just a wire" so there isn't a cost or test-time problem. Large customers can avoid the bad cables by experience but this is Ethernet; any cable from Fry's should work.

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

Proposed Response  Response Status  W
PROPOSED REJECT.
This comment was submitted against D2.0. The comment was accepted in principle with remedy to specify minimum of 50 MHz for 85.9 channel parameters and 85.10 cable assembly parameters as sufficient to characterize impairments.

Cl  85  SC  85.13.3  P  265  L  1  #  372
Ganga, Ilango  Intel

Comment Type  E  Comment Status  D
Subclause title 85.13.3 and table for environmental requirements appears out of place.
Move title of subclause 85.13.4 Major capabilities/options to 85.13.3 and move the current title 85.13.3 to start after Major capabilities/options.
Add a subclause with title 86.13.4.7 Environmental specifications and move the table on page 265 for environmental requirements to this subclause.

Suggested Remedy
As per comment

Proposed Response  Response Status  W
PROPOSED ACCEPT.

Cl  85  SC  85.13.4.5  P  269  L  32  #  574
Ganga, Ilango  Intel

Comment Type  E  Comment Status  D
Inconsistent font size in column 4 of table. Change font size to be consistent for the PICS tables

Suggested Remedy
As per comment

Proposed Response  Response Status  W
PROPOSED ACCEPT.

Cl  85  SC  85.7.1  P  238  L  26  #  271
Frazier, Howard  Broadcom Corporation

Comment Type  ER  Comment Status  D
The sentence "A 40GBASE-CR4 and 100GBASE-CR10 link is illustrated in Figure 85-2." implies that this draft is describing a single link that can be 40GBASE-CR4 and 100GBASE-CR10 simultaneously. This is not the case. You can either have a link that complies with 40GBASE-CR4, or a link that complies with 100GBASE-CR10, but not a link that complies with both simultaneously.

Suggested Remedy
Change the sentence to read:
A block diagram for a 40GBASE-CR4 or 100GBASE-CR10 link is illustrated in Figure 85-2.

Proposed Response  Response Status  W
PROPOSED ACCEPT IN PRINCIPLE.
Change: A 40GBASE-CR4 and 100GBASE-CR10 link is illustrated in Figure 85-2.
To: A 40GBASE-CR4 or 100GBASE-CR10 link is illustrated in Figure 85-2.
Change: Figure 85-2-40GBASE-CR4 and 100GBASE-CR10 link (half link is illustrated)
To: Figure 85-2-40GBASE-CR4 or 100GBASE-CR10 link (half link is illustrated)
CL 85  SC 85.7.1  P 238  L 27  # 272
Frazier, Howard  Broadcom Corporation

Comment Type: ER  Comment Status: D
"points" is ambiguous in the sentence "For purposes of system conformance, the PMD sublayer is standardized at the points described in this subclause."

Suggested Remedy:
change "points" to "test points", as in: "For purposes of system conformance, the PMD sublayer is standardized at the test points described in this subclause."

Proposed Response  Response Status: W
PROPOSED ACCEPT.
change "points" to "test points"

CL 85  SC 85.7.1  P 238  L 34  # 273
Frazier, Howard  Broadcom Corporation

Comment Type: ER  Comment Status: D
The sentence: "The 40GBASE-CR4 and 100GBASE-CR10 channel is defined between the transmitter (TP0) and receiver blocks (TP5)..." implies that this draft is describing a channel that can be 40GBASE-CR4 and 100GBASE-CR10 simultaneously. This is not the case.

Suggested Remedy:
Change the sentence to read: "The 40GBASE-CR4 and 100GBASE-CR10 channels are defined between the transmitter (TP0) and receiver blocks (TP5)..."

Proposed Response  Response Status: W
PROPOSED ACCEPT.
See suggested remedy.

CL 85  SC 85.7.12  P 307  L 4  # 286
Bandopadhyay, Jaya  Juniper Networks

Comment Type: T  Comment Status: D
Clause 85 adds 72.6.10 as mandatory. This is not in sync with clause 86 and also not in sync with SFP+ direct attach. If one wants to use common components between 40/100G-CR and SR and SFP+ direct attach, since SR PMD does not require this remote Rx training from Rx, it becomes very difficult for implementer. For example, if one uses a retiming device with transmit pre-emphasis between big chip with integrated PHY and SR module, but wants to plug in Cu cables on the same slot, how would the training work for CR case? Assumption here is retiming device's Tx is able to handle the Cu cable impairments.

Suggested Remedy:
In order to provide maximum flexibility in system implementation, make 72.6.10 optional for CR case. This means if the KR phy talks directly to the media (copper or fiber), training can be utilized.

Proposed Response  Response Status: W
PROPOSED REJECT.
See suggested remedy.

CL 85  SC 85.7.7  P 241  L 3  # 276
Frazier, Howard  Broadcom Corporation

Comment Type: TR  Comment Status: D
Disabling any of the lanes of the PMD using the lane-by-lane disable function effectively disables the whole interface, since we haven't defined a mechanism by which an interface can operate without the full complement of lanes. Thus, the draft should include a warning, in the form of a note, that disabling one or more lanes will disable the interface, and can be disruptive to a network.

Suggested Remedy:
Add a note at the end of 85.7.7 that reads:

NOTE - Disabling the electrical transmitter on one or more lanes effectively disables the entire interface and can be disruptive to a network.

Proposed Response  Response Status: W
PROPOSED ACCEPT IN PRINCIPLE.
Add note:
NOTE - A mechanism by which an interface can operate without the full complement of lanes is not specified to ensure the CR4/CR10 signalling rate at effective BER.
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  RESPONSUE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Cl 85  SC 85.7.9  P241  L32  #277
Frazier, Howard  Broadcom Corporation
Comment Type: TR  Comment Status: D
There is no Clause 45 register bit referenced for PMD_fault in this subclause.
SuggestedRemedy
Delete the words "If the MDIO is implemented" at the beginning of the first sentence. Add the sentence: "If the MDIO interface is implemented, PMD_fault shall be mapped to the PMD_fault bit as specified in 45.2.1.2.
Proposed Response  Response Status: W
PROPOSED ACCEPT IN PRINCIPLE.
For committee discussion; need to reconcile with 84.7.9 and 86.5.9.

Cl 85  SC 85.8  P243  L24  #226
Misek, Brian  Avago Technologies
Comment Type: T  Comment Status: D
Amplitude peak to peak should be clearly defined
SuggestedRemedy
Add to Value column:
min=800mV
Add note:
KR Preset State 72.6.10.2.3.1 and alternating 1010 output. Note (a)
Proposed Response  Response Status: W
PROPOSED ACCEPT IN PRINCIPLE.
Add - Amplitude peak-to-peak min=800 mV to Table 85-4 value column.

Cl 85  SC 85.8  P243  L28  #247
Misek, Brian  Avago Technologies
Comment Type: T  Comment Status: D
The MCB fixture and cables to the scope have an effect on this measurement. They need to be allowed for.
1.25dB PCB on HCB
.5dB for connector
.8dB for instrument grade cables.
1.5dB for Package losses
0.7 to 2.4dB host PCB loss
Total is 3.05dB in addition to the channel PCB for the A1+a2
SuggestedRemedy
Change AN1  From: Max=2.5   To: 4.05
Change AN1  From: Min=1.25   To: 1.75
Change AN2 From: Max=1 to Max=2.45
Change AN2 From: Min=0   To: 1.5
Proposed Response  Response Status: W
PROPOSED ACCEPT IN PRINCIPLE.
For committee discussion

Cl 85  SC 85.8  P243  L34  #227
Misek, Brian  Avago Technologies
Comment Type: T  Comment Status: D
The Noise numbers are wrong. The original presentation in Moore01_0509.pdf had a formula basing the noise as a function of the input signal.
For a 1V signal the rms noise was 6mV for the short cable and is now labeled "near-end" and 0.6mV for the long cable or "far end"
SuggestedRemedy
Change the values to:
Noise near-end = 6mV*10E(-AN0/20)
Noise far-end = 0.6*10E(-AN0/20)
Proposed Response  Response Status: W
PROPOSED ACCEPT IN PRINCIPLE.
For committee discussion
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<td>85</td>
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<td>243</td>
<td>46</td>
<td>228</td>
<td>T</td>
<td>D</td>
<td>Avago Technologies</td>
<td>Total jitter is wrong. If the filter to remove DJ is used then the Jitter measured at the output of that filter will be limited to a value slightly greater than the KR TP0 specified to allow for additional non-equalizable ISI caused by the PCB-connector-TP0 test board (HCB). That additional ISI was budgeted to be 50mUI in the original Moore-01-0509. Somehow we got to 250mUI which is less than the KR 280mUI at the pins of the package.</td>
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<tr>
<td>85</td>
<td>85.8</td>
<td>243</td>
<td>32</td>
<td>229</td>
<td>T</td>
<td>D</td>
<td>Avago Technologies</td>
<td>Change: change input(i) to output(i) line 33 page 244. add definition: input(i) The DFT of a 1.0 Vp-p PRBS pattern.</td>
<td></td>
</tr>
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</table>

**Comment Status: D/dispatched**

**Response Status: W/written**

**Proposed Response**

**Suggested Remedy**

**Comment Type E**

for 50 MHz ≤ f ≤ 6000 MHz should be removed.

**Suggested Remedy**

Remove

for 50 MHz ≤ f ≤ 6000 MHz

**Proposed Response**

**Response Status W**

**Proposed Accept**

**Suggested Remedy**

The link spans for 40GBASE-CR4 and 100GBASE-CR10 are not going to reach 10 m. I don't think the link budget will close at 6 m after making a reasonable allowance for realistic PCB trace loss, and properly accounting for FEXT and cable insertion loss.

**Suggested Remedy**

Reduce the maximum link span to 5 m. This will require a change to the objectives for 40G and 100G copper, and the new objectives must be re-evaluated against the 5 Criteria, particularly Broad Market Potential, Technical Feasibility, and Economic Feasibility.

**Proposed Response**

**Response Status W**

**Proposed Reject**

See response to comment #170
### Draft 2.1 Comments

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<th>Force10 Networks</th>
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<td>85.8.3</td>
<td>242</td>
<td>28</td>
<td>304</td>
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<td>Propose: rewrite sentences to better link the transmitter characteristics in Table 85-4 to the &quot;Shall&quot; statement. Transmitter characteristics shall meet specifications at TP2, unless otherwise noted. The specifications at TP2 are summarized in Table 85-4.</td>
<td>Proposed Response:</td>
<td>Response Status:</td>
<td>W</td>
</tr>
</tbody>
</table>

**Suggested Remedy:**
Transmitter characteristics shall meet specifications summarized in Table 85-4 at TP2 unless otherwise noted.

**Proposed Response: Response Status: W**

**PROPOSED ACCEPT IN PRINCIPLE.** Change sentence to read: Transmitter characteristics shall meet specifications summarized in Table 85-4 at TP2 unless otherwise noted.

---

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<td>Propose: Table 85-4 title indicates that the transmitter characteristics are at TP2, but over half of the table appears related to specifications at &quot;transmit function&quot;.</td>
<td>Suggested Remedy:</td>
<td>Proposed Response:</td>
<td>W</td>
</tr>
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</table>

**Suggested Remedy:**
Split into two tables. One for specifications at "transmit function" and one for TP2.

**Proposed Response: Response Status: W**

**PROPOSED REJECT.** Clarify where the differential peak-to-peak output voltage (max) with Tx disabled is to be measured and what fixturing is to be used.

---

<table>
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<td></td>
<td>Propose: Table 85-4 shows peak-to-peak amplitude at TP2 is max 1200mV (after removing the ILTP2(f) from the signal at TP2). That means it's basically 1200mV peak-to-peak amplitude at TP0. ILTP2 = ILpcb min + conn min + HCB min. ILTP2 = 1.2dB + 0.5dB + 1.26dB. So, with max 1200mV at TP0, TP2 amplitude will violate max 750mV amplitude allowed for eye mask at TP1a point for SR. TP1a (for SR) and TP2 (for CR) are the same point from a system point of view.</td>
<td>Suggested Remedy:</td>
<td>Proposed Response:</td>
<td>W</td>
</tr>
</tbody>
</table>

**Suggested Remedy:**
Adjust max amplitude voltage specification for CR to match with SR at test point TP1a and TP2.

**Proposed Response: Response Status: W**

**PROPOSED REJECT.** Specified loss budget consistent with baseline objectives of at least 10 m reach constrained by 802.3ap channel insertion loss and Tx/Rx PCB loss; see diminico_02_1108.

---

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

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

**SORT ORDER:** Clause, Subclause, page, line
# 124
Cl 85  SC 85.8.3  P 243  L 27  
Healey, Adam  LSI Corporation

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

If this is a coefficient of insertion loss then the nominal range of AN0 should be -1.6 to 2.0 dB which corresponds to 1.2 and 0.8 V differential peak-to-peak output amplitudes respectively.

However, this leaves no allowance for the DC loss of the host channel when a -KR compliant device delivers 0.8 V at TP0. Note that the nPPI host channel recommendations (refer to 86A.6) allow 0.56 dB loss at 10 MHz between TP0 and TP1a (comparable to -CRn TP2).

**Suggested Remedy**
Change AN0 range to -1.6 to 2.5 dB.

**Proposed Response**  **Response Status**  W
PROPOSED ACCEPT IN PRINCIPLE. For committee discussion

---

# 125
Cl 85  SC 85.8.3  P 243  L 32  
Healey, Adam  LSI Corporation

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

AN1+AN2 allocation of 3 dB (max.) isn’t even adequate to cover the budgetary allocations for the host printed circuit board (PCB) trace (2.37 dB) and host compliance board (HCB) PCB trace (1.26 dB) never mind the device package and connector.

**Suggested Remedy**
Revise the AN1, AN2, and AN1+AN2 allowances to be consistent with the total loss of the components between the transmit function and TP2.

**Proposed Response**  **Response Status**  W
PROPOSED ACCEPT IN PRINCIPLE. See comment response #247

---

# 136
Cl 85  SC 85.8.3  P 243  L 28  
Healey, Adam  LSI Corporation

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

While it may be true that...

1. A polynomial in sqrt( f ) is a reasonable model for the transfer function of printed circuit board (PCB) traces and...
2. One can also derive a formula that maps the coefficient of the f^2 term in the transfer function to the 20 to 80% rise time of the function’s output

...this model may not apply equally well to all implementations of a driver compliant to 10GBASE-KR requirements. One possible outcome of the deficiency in the model is that some weighted least squares coefficients (e.g. AN1 and AN4) may turn out to be negative.

This is not permitted per the requirements stated in Table 85-4 ruling out otherwise valid implementations.

**Suggested Remedy**
Refer to healey_01_0709.pdf.

**Proposed Response**  **Response Status**  W
PROPOSED REJECT. The commenter has not provided a sufficiently complete proposal that would enable the implementation of suggested remedy; for committee discussion see healey_01_0709.pdf.

---

# 137
Cl 85  SC 85.8.3  P 243  L 34  
Healey, Adam  LSI Corporation

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

In Table 85-4, the requirements for near-end and far-end noise make no sense. One would expect the long channel transfer function to reduce the noise, not enhance it.

**Suggested Remedy**
Refer to healey_02_0709.pdf.

**Proposed Response**  **Response Status**  W
PROPOSED REJECT. The commenter has not provided a sufficiently complete proposal that would enable the implementation of suggested remedy; for committee discussion see healey_02_0709.pdf.
Comment Type T Comment Status D
The are multiple formatting and technical issues with the "Max. output jitter" row of Table 85-4.

1. Align characteristic values with the corresponding names.
2. The note that "Jitter measurements at TP2" is unnecessary. In the first paragraph of 85.8.3, it is stated that "the specifications at TP2 are summarized in Table 85-4."
3. "Jitter is specified at a BER of 10^-12" only applies to random and total jitter, and should be noted accordingly.
4. It is not stated anywhere how these parameters are to be measured.

Suggested Remedy
Per comment. For item 4, refer to healey_01_0709.pdf.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

In Table 85-4:
1. Align characteristic values with the corresponding names.
2. Remove "Jitter measurements at TP2"
3. Note: The total Jitter and random jitter is specified at a BER of 10^-12

Comment Type T Comment Status D
Table 85-4 TP2 jitter numbers should match Annex 86A table 86-A-1. They are the same test point from a system point of view. They should also follow the same methodology.
Table 86A-1 has J2=0.18UI, J9=0.26UI. Table 85-4 has RJ=0.15UI, TJ=0.25UI.

Suggested Remedy
Have a common set of measurement parameters at these test points.

Proposed Response Response Status W
PROPOSED REJECT.

TP2 jitter numbers consistent with baseline objectives to utilize 10GBASE-KR electrical specifications (Clause 72) for 40GBASE-CR4 and 100GBASE-CR10 baseline electrical specifications with applicable revisions to account for differences in channel parameters e.g., copper cable assembly versus backplane and the 4-lane and 10-lane operation versus serial operation.

Comment Type TR Comment Status D
10GBASE-KR compliant devices may exhibit up to 3.5% duty cycle distortion at TP0. Since the insertion loss of the printed circuit board trace, connector, and test fixture will amplify duty cycle distortion, the allowance at TP2 needs to be increased accordingly.

Suggested Remedy
Refer to healey_01_0709.pdf.

Also note that there is no cross-reference to the duty cycle distortion measurement procedure in clause 72. Add a cross-reference or find some other means to define how the parameter should be measured.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

Add cross-reference to the duty cycle distortion measurement procedure in clause 72.

Comment Type TR Comment Status D
Table 85-4, note a) states that the associated parameters are "measured with effect of ILTP2(f) loss Equation (85-2) mathematically removed from the signal at TP2 using a software FIR filter that is no more then 6 UI long."

A user of the standard is given no guidance regarding how such a filter may be derived or implemented.

Suggested Remedy
Refer to healey_01_0709.pdf.

Proposed Response Response Status W
PROPOSED REJECT. The commenter has not provided a sufficiently complete proposal that would enable the implementation of suggested remedy; for committee discussion see healey_01_0709.pdf.
<table>
<thead>
<tr>
<th>Comment #</th>
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<tr>
<td>#190</td>
<td>TR</td>
<td>D</td>
<td>Differential output return loss at TP2 is referenced to CL 72 which was for KR chip return loss and is not relevant to TP2 which include chip + channel + connector</td>
<td>Clasue 86 has already worked through the effect of chip, channel, and connector. Please use Eq 86A-1</td>
<td>W</td>
<td>PROPOSED REJECT. Differential output return loss of KR is still applicable. PCB loss should improve differential output return loss at TP2. For committee discussion.</td>
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<tr>
<td>#191</td>
<td>TR</td>
<td>D</td>
<td>Common mode voltage output for CL85 is 30 mV this huge or 2X CL86, what is the justifications for this. Is this because copper cable are better schied than optical fiber!</td>
<td>As compromise propose 20 mV</td>
<td>W</td>
<td>PROPOSED REJECT. The commenter has not provided a sufficiently complete proposal that would enable the implementation of suggested remedy; for committee discussion.</td>
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<tr>
<td>#193</td>
<td>TR</td>
<td>D</td>
<td>ILTP2 ANx include the loss of host PCB channel, connector, package, and ESD diode. ILTP2 does not provide useful normative set of parameters, if the device delivers the VMA and jitter ILTP2 does not add anything.</td>
<td>propose to move ILTP2 to informative section for SI work. Replace ILTP2 with VMA value per draft D1.2 267 mV, Q50=55, Vertical eye opening of 340 mV</td>
<td>W</td>
<td>PROPOSED REJECT. Consensus to implement ILTP2 in D2.1 see resolution to comment #697.</td>
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<tr>
<td>#194</td>
<td>TR</td>
<td>D</td>
<td>Total jitter of 0.25 UI is even tighter than CL86 this was KR chip output TJ not the TP2. Table 85A-1 TP0 TJ=0.28 UI, looks like you need add a jitter attenuator to meet TP2</td>
<td>Total jitter of 0.25 UI is even tighter than CL86 this was KR chip output TJ not the TP2. Table 85A-1 TP0 TJ=0.28 UI, looks like you need add a jitter attenuator to meet TP2</td>
<td>W</td>
<td>PROPOSED ACCEPT IN PRINCIPLE. Footnote: Total jitter of 0.25 UI excluding DDJ</td>
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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: Clause, Subclause, page, line
**Comment:** It was not agreed in the meeting to incorporate "Measured with effect of ILTP2(f) loss equation 85-2 mathematically removed from the signal at TP2 using software FIR filter that is no more then 6 UI long"

**Suggested Remedy:** Please remove it

**Proposed Response:** PROPOSED REJECT.

**Comment Status:** D
**Response Status:** W
**Proposed Response:** PROPOSED REJECT.

Incorporation of text per D2.0 comment resolutions; see >>
http://www.ieee802.org/3/ba/public/may09/P8023ba-D20-Final_Responses_byClsla.pdf
comment resolution number 697 and reference Moore01_0509.pdf
(http://www.ieee802.org/3/ba/public/may09/moore_01_0509.pdf) to incorporate table and notes.

> note > b) Measured with effect of ILTP2 loss mathematically removed from the signal at TP2 using a software FIR filter that is no more then 6UI long.

---

**Comment:** What does it mean to send a test pattern "through TP2" and terminate all other transmitters "beyond TP2"? The first paragraph of 85.8.3 states "transmitter characteristics shall meet specifications at TP2."

**Suggested Remedy:** Change text to read:

"The noise parameters specified in Table 85-4 are shall be measured with the transmitter of the disturbed lane sending PRBS9 and the transmitters of all other lanes sending PRBS31. All lanes shall be terminated at TP2 with an impedance meeting the requirements of 85.8.3.4."

**Proposed Response:** PROPOSED ACCEPT IN PRINCIPLE.

---

**Comment:** There is no bound on the difference between the linear fit insertion loss (ILTP2) and the original function (XFR) which somewhat diminishes the meaning of the fit.

**Suggested Remedy:** Refer to healey_01_0709.pdf.

**Proposed Response:** PROPOSED REJECT. The commenter has not provided a sufficiently complete proposal that would enable the implementation of suggested remedy; for committee discussion see healey_01_0709.pdf.

---

**Comment:** spelling transmitt

**Suggested Remedy:** change transmitt to transmit

**Proposed Response:** PROPOSED ACCEPT.
<table>
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<th>SC</th>
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<tr>
<td>85</td>
<td>85.8.3.2</td>
<td>244</td>
<td>29</td>
<td>T</td>
<td>D</td>
<td>The definition of Input(i) is incorrect -- it is actually the definition of Output(i). The definition of Output(i) is missing.</td>
<td>Change &quot;Input(i)&quot; to &quot;Output(i).&quot; Add the following definition for &quot;Input(i)&quot;: &quot;DFT of the 1 V peak-to-peak PRBS9 pattern&quot;</td>
<td>PROPOSED ACCEPT IN PRINCIPLE. See remedy comment #229</td>
<td></td>
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<tr>
<td>85</td>
<td>85.8.3.2</td>
<td>244</td>
<td>37</td>
<td>TR</td>
<td>D</td>
<td>Apparent units for equation 85-2 need to be GHz.</td>
<td>Put note suggesting f is in GHz or scale eq 85-27 to 85-30</td>
<td>PROPOSED ACCEPT IN PRINCIPLE. See response comment #230</td>
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<tr>
<td>85</td>
<td>85.8.3.2</td>
<td>244</td>
<td>50</td>
<td>T</td>
<td>D</td>
<td>Equation (85-3) is wrong. The coefficients an are complex numbers and the scale factor is incorrect.</td>
<td>Change Equation (85-3) to read:</td>
<td>PROPOSED ACCEPT.</td>
<td></td>
</tr>
</tbody>
</table>

Healey, Adam
LSI Corporation

Mellitz, Richard
Intel

Healey, Adam
LSI Corporation

Healey, Adam
LSI Corporation
Comment Type: T  Comment Status: D
Equation (85-3) has no dependency on frequency so the associated frequency range specified on line 51 makes no sense.

Suggested Remedy
Delete text "for 50 MHz <= f <= 6000 MHz"

Proposed Response  Response Status: W
PROPOSED ACCEPT IN PRINCIPLE. See response to comment #230

Comment Type: T  Comment Status: D
Equation (85-7) is wrong. W(i) should not be raised to the nth power.

Suggested Remedy
Change (85-7) to read:
"\[ m_{n} = \frac{\sum_{i=0}^{i=510} W(i) \sqrt{i \cdot df}^n }{weight} \]"

Proposed Response  Response Status: W
PROPOSED ACCEPT.
Change (85-7) to read:
"\[ m_{n} = \frac{\sum_{i=0}^{i=510} W(i) \sqrt{i \cdot df}^n }{weight} \]"

Comment Type: T  Comment Status: D
The variable mx7 is never used, so there is no need to include n = 7.

Suggested Remedy
Define n to be "1, 2, 3, 4, 5, 6, 8".

Proposed Response  Response Status: W
PROPOSED ACCEPT.
Define n to be "1, 2, 3, 4, 5, 6, 8".

Comment Type: TR  Comment Status: D
Wrong reference
Suggested Remedy
Should be table 85-4 not 85-6
Proposed Response  Response Status: W
PROPOSED REJECT. Can't find wrong reference page 248 line 40.
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<td><strong>Comment</strong></td>
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<tr>
<td>Reconcile any ambiguity between frequency range described in text with equations 85-1 to 85-30.</td>
<td><strong>Suggested Remedy</strong></td>
<td>Reconcile any ambiguity between frequency range described in text with equations 85-1 to 85-30.</td>
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<td><strong>Proposed Response</strong></td>
<td><strong>Response Status</strong></td>
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<tr>
<td>PROPOSED ACCEPT IN PRINCIPLE. Reconcile any ambiguity between frequency range described in text with equations 85-1 to 85-30.</td>
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<td>MC Communications</td>
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| **Comment**  |    |                |   |
| Reconcile any ambiguity between frequency range described in text with equations 85-1 to 85-30. | | |
| **Suggested Remedy** | | Reconcile any ambiguity between frequency range described in text with equations 85-1 to 85-30. |
| **Proposed Response** | **Response Status** | **W** |
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| **Comment**  |    |                |   |
| The coefficients $a_0$, $a_2$, $a_2$, and $a_4$ are determined using Equation (85-2) through Equation (85-2) is incorrect. | | |
| **Suggested Remedy** | | The coefficients $a_0$, $a_2$, $a_2$, and $a_4$ are determined using Equation (85-4) through Equation (85-30). |
| **Proposed Response** | **Response Status** | **W** |
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| **Comment**  |    |                |   |
| Limit specification of PCB loss terms to square root and linear with F. Higher order terms are not needed for this short of a board. | | |
| **Suggested Remedy** | | Limit specification of PCB loss terms to square root and linear with F. Higher order terms are not needed for this short of a board. |
| **Proposed Response** | **Response Status** | **W** |
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| **Comment**  |    |                |   |
| This whole section does not make sense to me. The Test fixture will be attached to the host through the connector to yield a TP2 test point. As such the test fixture must be evaluated in a different manner than is represented here. The Test fixture could be called the Module Compliance Board (MCB) and should be normatively specified as was the case for SFI. That is it shall have a normative IL limit (min and Max). This then causes us to need some way of testing the "goodness" of the HCB. A Cable Compliance board could be used to test the Host Compliance board. | | |
| **Suggested Remedy** | | Recommend adoption in principle of methodology of Section 86A.5.1 as pertaining to test board loss and definition with the requested further study of: 1) that the acceptable region of the mated HCB-CCB not have the drop in the SDD21 around 5.7GHz. This step would allow hazardous ripple in the SDD21 that could invalidate jitter measurements. 2) The section on FEXT and NEXT. |
| **Proposed Response** | **Response Status** | **W** |
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| The coefficients $a_0$, $a_2$, $a_2$, and $a_4$ are determined using Equation (85-2) through Equation (85-2) is incorrect. | | |
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| **Suggested Remedy** | | Recommend adoption in principle of methodology of Section 86A.5.1 as pertaining to test board loss and definition with the requested further study of: 1) that the acceptable region of the mated HCB-CCB not have the drop in the SDD21 around 5.7GHz. This step would allow hazardous ripple in the SDD21 that could invalidate jitter measurements. 2) The section on FEXT and NEXT. |
| **Proposed Response** | **Response Status** | **W** |
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| The coefficients $a_0$, $a_2$, $a_2$, and $a_4$ are determined using Equation (85-2) through Equation (85-2) is incorrect. | | |
| **Suggested Remedy** | | The coefficients $a_0$, $a_2$, $a_2$, and $a_4$ are determined using Equation (85-4) through Equation (85-30). |
| **Proposed Response** | **Response Status** | **W** |
| | | |
Draft 2.1 Comments

IEEE P802.3ba D2.1 40Gb/s and 100Gb/s Ethernet comments

Working Group ballot

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<td>#112</td>
<td>E</td>
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<td>The Amax equation and its associated parameters (b1, b2, b3, b4) are repeatedly defined throughout the document. Defining Amax in one place (with b1...b4) and then referring to Amax in subsequent equations (with cross-reference) would be a cleaner approach.</td>
<td>W</td>
<td>PROPOSED ACCEPT IN PRINCIPLE. Define Amax in one place (with b1...b4) and then refer to Amax in subsequent equations (with cross-references).</td>
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<td>P247</td>
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<td>#115</td>
<td>T</td>
<td>D</td>
<td>Test fixture insertion loss allowance is too large. Equation 85-33 corresponds to 4.5 dB loss at half of the signaling rate.</td>
<td>W</td>
<td>PROPOSED ACCEPT IN PRINCIPLE. Define a common set of HCB’s should be a goal of this project between clause 85 and 86A. The HCB is a means to a measurement. 85 is .053 x [20 x log10(e) x (2E-5(sqrt(f)+1.1E-10)) 86A is 20 X Log10(</td>
<td>SDD21</td>
<td>)= -.01 -.3 x sqrt(f)-.11 x f</td>
<td></td>
</tr>
<tr>
<td>85</td>
<td>85.8.4</td>
<td>P248</td>
<td>16</td>
<td>#40</td>
<td>T</td>
<td>D</td>
<td>Change to clearly normative text, and to match transmitter section.</td>
<td>W</td>
<td>PROPOSED ACCEPT IN PRINCIPLE.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Comment: The receiver characteristics at TP3 are summarized in Table 85-5. The specifications at TP2 are summarized in Table 85-5. The transmitter specifications at TP5 are provided informatively in Annex 85A, Table 85A-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: Clause, Subclause, page, line

Page 69 of 104 7/9/2009 1:43:41 PM
Cl 85 SC 85.8.4 P 248 L 17 # 307
D'Ambrosia, John Force10 Networks

Comment Type TR
Comment Status D

No "Shall" statement related to the Rx characteristics at TP3 are included or appropriate
PICS for Differential peak-to-peak input amplitude tolerance, differential input return loss, or
differential to common mode conversion SCD11.

Suggested Remedy
Modify sentence in 85.8.4 to:

Receiver characteristics shall meet specifications, summarized in Table 85-5, at TP3.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
(1) See response to comment #40 for text
(2) Add PICS

Cl 85 SC 85.8.4 P 248 L 38 # 308
D'Ambrosia, John Force10 Networks

Comment Type T
Comment Status D

CR Rx based on 100BASE-KR. Missing note in Table 85-5.

Suggested Remedy
add following note (ref Table 72-9)
- The receiver shall tolerate amplitudes up to 1600 mV without permanent damage.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
See suggested remedy.

Cl 85 SC 85.8.4.1 P 249 L 41 # 115
Marris, Arthur Cadence

Comment Type E
Comment Status D

spelling

Suggested Remedy
change interference to interference

Proposed Response Response Status W
PROPOSED ACCEPT.
See suggested remedy.

Cl 85 SC 85.8.4.1 P 249 L 11 # 235
Misek, Brian Avago Technologies

Comment Type T
Comment Status D

Broad band noise values need to be justified. The noise far end for the Tx has the nFEXT
in it and has been shaped by the longest cable. This means it should represent the FEXT
noise and was less then the 3mV. The test calls out all active channels. What is the source
of the noise be injected? How should it be injected? It would be easiest to inject it at the Tx
end if on is using a cable to model the channel. The noise would then be shaped by the
channel transfer function.

Suggested Remedy
With the definition of HCB ans CCB boards it becomes possible to explicitly call out this
test procedure.
If a cable is used, then guidance to how the test setup can be constructed would be
needed.

Proposed Response Response Status W
PROPOSED REJECT.
[Editor's note: References changed from 86.8.4.1]
The commenter has not provided a sufficiently complete proposal that would enable the
implementation of suggested remedy; for committee discussion.

Cl 85 SC 85.8.4.2 P 249 L 22 # 138
Healey, Adam LSI Corporation

Comment Type TR
Comment Status D

The definition of the test channel for interference tolerance testing is flawed.
1. The heading of 85.8.4.1 implies that the receiver interference tolerance requirements
apply at TP3. Thus, ILch is not an appropriate reference function since it "double counts"
the loss from TP3 to the TP5 (i.e. this loss is built into the device under test).
2. It is not appropriate to define the test channel in terms of a linearly scaled version of
some reference function, since not every compliant cable assembly exhibits a transfer
function that is a linearly scaled version of that reference function. For example, as the ratio
of the coefficient of sqrt( f ) to the coefficient of f deviates from the ratio defined by the
reference function, the linear fit parameters mTC and bTC start to lose meaning.

Suggested Remedy
Refer to healey_03_0709.pdf.

Proposed Response Response Status W
PROPOSED REJECT. The commenter has not provided a sufficiently complete proposal
that would enable the implementation of suggested remedy; for committee discussion see
healey_03_0709.pdf.
<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>Comment Type</th>
<th>Suggested Remedy</th>
<th>Proposed Response</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>85</td>
<td>85.8.4.2</td>
<td>249</td>
<td>28</td>
<td>T</td>
<td>ILch(f) is not 85.9. It is 85A-4 with 1/2 of the ILpcb removed. This should be ILtch for IL test channel.</td>
<td>ILtch(f) &gt;= ILchmax(f) - 0.5*ILpc(f)</td>
<td>PROPOSED ACCEPT IN PRINCIPLE.</td>
</tr>
<tr>
<td>85</td>
<td>85.8.4.2</td>
<td>249</td>
<td>32</td>
<td>E</td>
<td>&quot;isertion&quot; should be &quot;insertion&quot;</td>
<td></td>
<td></td>
</tr>
<tr>
<td>85</td>
<td>85.8.5</td>
<td>253</td>
<td>22</td>
<td>TR</td>
<td>Differential return loss for TP3 is refered to KR chip return loss which is no relevant.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>85</td>
<td>85.8.5.1</td>
<td>253</td>
<td>32</td>
<td>TR</td>
<td>Interference test is not sufficiently described wihtout pulse or impulse response of the cable.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>85</td>
<td>85.9</td>
<td>250</td>
<td>27</td>
<td>E</td>
<td>fix typo: insertion loss deviation (ILD)</td>
<td></td>
<td></td>
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</tbody>
</table>

**Response Status:** D/dispatched  A/accepted  R/rejected  O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
<table>
<thead>
<tr>
<th>Cl</th>
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<th>SC</th>
<th>85A.3</th>
<th>P</th>
<th>402</th>
<th>L</th>
<th>28</th>
<th># 289</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Bandyopadhyay, Jaya</td>
<td>Juniper Networks</td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

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

85A.4 pcb channel loss allowed to support 10m copper cable will make practical system implementation extremely difficult.

**Suggested Remedy**
Reduce the allowable cable length objective from 10m to "x"m. "X" would need future measurement and analysis work.

**Proposed Response**
**Response Status:** **W**

PROPOSED REJECT. The commenter has not provided a sufficiently complete proposal that would enable the implementation of suggested remedy; for committee discussion.

<table>
<thead>
<tr>
<th>Cl</th>
<th>85A</th>
<th>SC</th>
<th>85A.2</th>
<th>P</th>
<th>401</th>
<th>L</th>
<th>16</th>
<th># 130</th>
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<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Healey, Adam</td>
<td>LSI Corporation</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

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

Since the transmitter characteristics defined at TP0 are essentially identical to 10GBASE-KR (40GBASE-KR4) seems unnecessary to define them again here in an informative manner. A cross reference should suffice.

**Suggested Remedy**
State that the intent is to have the transmitter characteristics at TP0 match the 40GBASE-KR4 transmitter characteristics at TP1 and supply the appropriate cross reference. Delete all other text in this subclause. Note the title should be corrected to read “TP-0” (zero) and not “TP-O” (“oh”).

**Proposed Response**
**Response Status:** **W**

PROPOSED ACCEPT IN PRINCIPLE. See suggested remedy.

<table>
<thead>
<tr>
<th>Cl</th>
<th>85A</th>
<th>SC</th>
<th>85A.2</th>
<th>P</th>
<th>401</th>
<th>L</th>
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<th># 315</th>
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<tr>
<td></td>
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<td></td>
<td>D'Ambrosia, John</td>
<td>Force10 Networks</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

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

The transmitter characteristics at Transmit function are defined normatively in Clause 83 and then defined informatively in 83A.2. This will cause confusion.

**Suggested Remedy**
Delete subclause 83A.2

**Proposed Response**
**Response Status:** **W**

PROPOSED ACCEPT IN PRINCIPLE. See response to comment #130
<table>
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<th>Cl 85A</th>
<th>SC 85A.2</th>
<th>P 401</th>
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<tr>
<td>Comment Type</td>
<td>TR</td>
<td>Comment Status</td>
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<tr>
<td>AC common mode voltage can not be the same at TP0 and TP2</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>SuggestedRemedy</td>
<td>Propsoe to change the common mode volatage at the TP0 to 15 mV</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proposed Response</td>
<td>Response Status</td>
<td>W</td>
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<td></td>
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<tr>
<td>PROPOSED REJECT. The commenter has not provided a sufficiently complete proposal that would enable the implementation of suggested remedy; for committee discussion.</td>
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<tr>
<td>Comment Type</td>
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<tr>
<td>Since the receiver characteristics defined at TP5 are essentially identical to 10GBASE-KR (40GBASE-KR4) is seems unnecessary to define them again here in an informative manner. A cross reference should suffice.</td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>SuggestedRemedy</td>
<td>State that the intent is to have the receiver characteristics at TP5 match the 40GBASE-KR4 receiver characteristics at TP4 and supply the appropriate cross reference. Delete all other text in this subclause.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proposed Response</td>
<td>Response Status</td>
<td>W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROPOSED ACCEPT IN PRINCIPLE. See suggested remedy.</td>
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<table>
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<th>P 402</th>
<th>L 18</th>
<th># 208</th>
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<tr>
<td>Comment Type</td>
<td>TR</td>
<td>Comment Status</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>max input voltage 1200 mV exceed the CL86 max value, cusomters want CL85 and 86 to have common electrical!</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SuggestedRemedy</td>
<td>Make max input 850 mV more compatible with future CMOS process</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proposed Response</td>
<td>Response Status</td>
<td>W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROPOSED REJECT. max input 850 mV is inconsistent with max output of 1200 mV</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cl 85A</th>
<th>SC 85A.4</th>
<th>P 402</th>
<th>L 25</th>
<th># 526</th>
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<tbody>
<tr>
<td>Comment Type</td>
<td>TR</td>
<td>Comment Status</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>The stated insertion loss for Tx / Rx PCB trace in Eqs 85A-1 and 85A-2 is specified up to 6GHz. The stated channel insertion loss in Eqs 85A-3 and 85A-4 is only specified up to 5.1625GHz. There are no constraints on the insertion loss above the stated frequencies. The same is true for the cable assembly in Eq. 85-40.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-CR PMD is based on -KR. Therefore, prior knowledge achieved with -KR channels is relevant. During 802.3ap it was correlated that insertion loss above f2 could be indicative of poorer performance, therefore a bound on insertion loss above f2 was created.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SuggestedRemedy</td>
<td>Extend Eq's 85a-3 and 85a-4 to 6 GHz add equation to upper bound in 85A.1, 85A.2 and 85A.5 base on equation 69B-8. In that equation, change Amax(f) to ILcamax(f), and change f2 to 6GHz.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proposed Response</td>
<td>Response Status</td>
<td>W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROPOSED ACCEPT IN PRINCIPLE. Reconcile the frequency range limit to 6 GHz in 85A.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Cl 85A</th>
<th>SC 85A.4</th>
<th>P 402</th>
<th>L 25</th>
<th># 526</th>
</tr>
</thead>
<tbody>
<tr>
<td>Comment Type</td>
<td>TR</td>
<td>Comment Status</td>
<td>D</td>
<td></td>
</tr>
<tr>
<td>Eq's 85A-1 and 85A-2 specify the maximum and minimum insertion loss for the Tx and Rx PCB trace loss. The problem is that it does not split the loss budget between the two boards, which could result in an interoperability issue, if one end of the link decides to use more of the total budget.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SuggestedRemedy</td>
<td>specify min and max trace loss per each board (multiply current equations by 1/2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Proposed Response</td>
<td>Response Status</td>
<td>W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PROPOSED ACCEPT IN PRINCIPLE. For committee discussion</td>
<td></td>
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</tr>
</tbody>
</table>
Comment Type: T
Comment Status: D
Split the loss in half explicitly for TP0-TP1 and TP4-TP5 PCB loss.

Suggested Remedy:
- Change line 30 and to an or.
- Change the scaling in 85A-1 to half the loss curve.
- Strike line: "The maximum insertion loss for the transmitter or the receiver differential controlled impedance printed circuit board is one half of...."

Proposed Response: REJECT. See response comment #233.

Comment Type: T
Comment Status: D
It is not clear what is meant by the "insertion loss between TP0-TP1 and TP4-TP5" since TP1 and TP4 are defined at the input (output) of the cable assembly test fixture.

Suggested Remedy:
- Modify the text to clarify the intent.

Proposed Response: ACCEPT IN PRINCIPLE.

Comment Type: T
Comment Status: D
Small PCB's can be accurately modeled by sqrt(f) and f terms.

Suggested Remedy:
- Remove 85A-1 and 2 f^2 and f^3 terms.

Proposed Response: REJECT. See response comment #233.
The stated 8” of PCB trace cannot be achieved with the current loss budget, and things will get worse once the budget is corrected. It’s more like 6” (=3” per end), and this simply isn’t enough for multi-port PHY’s. Board designers will need a loss budget of approximately 5 dB from TP0-TP1, and 5 dB from TP4-TP5 to account for PCB loss, connector loss, and other impairments.

**Suggested Remedy**
Increase the maximum loss to 5 dB from TP0-TP1, and TP4-TP5. This will result in a decrease in the link span, probably to 5 m once the link budget has been corrected to account for FEXT and cable insertion loss. This will require a change to the objectives for 40G and 100G copper, and the new objectives must be re-evaluated against the 5 Criteria, particularly Broad Market Potential, Technical Feasibility, and Economic Feasibility.

**Proposed Response**
Use response to comment #96 to consider PCB trace loss

**Proposed Accept in Principle.**

---

Now that there are test fixtures available for testing channels. A channel IL from TP0 to TP2 can be recommended that can be measured using probing on the ASIC bumps out to the TP2 SMA’s to assist board manufactures.

**Suggested Remedy**
Add section similar in scope to 86A.6 with appropriate reductions in the loss to match the PCB loss of the 85A interconnect.

**Proposed Response**

**Proposed Reject.**

The commenter has not provided a sufficiently complete proposal that would enable the implementation of suggested remedy; for committee discussion.
If the RL of the cable assembly is not improved as per a previous comment then the ILD of the channel must be increased. Reflections between the hosts and the connectors on the PC boards will create additional ripple over what is measure for the cable. The cable assembly is measured with better return loss connections then the host will provide and as such the informative overall channel ILD needs to be speced at a higher value than the cable. The calculation can be performed as shown:

1. If one connect two 2-port networks described in terms of S-parameters
   \[ SC21 = SA21*SB21/(1-SA22*SB11) \]
   where (SXIJ being complex numbers)

2. For the channels we work with, generally the phases of SA22 and SB11 are not specified or even specifiable. Therefore we can approximate:
   \[ | correction| < 20*log10(e)*SA22*SB11 \]

Worst case the uncertainty will add directly to ILD. Some will argue that it should RSS with ILD which might be slightly optimistic.

3. Assuming return loss of the channel TP0-TP2 is 12dB at Nyquist and Cable assembly return loss at Nyquist is 5.7dB
   \[ | correction| < 1.133 \]
4. Making similar assumptions for TP3-TP5, gives a second correction.
   \[ | correction| < 1.133 \]
5. RSSing the 2 corrections with the specified ILD=1.73dB for the Cable assembly at Nyquist gives:
   \[ ILD TP0-TP5 = 2.3 dB \]

Suggested Remedy
 Change ILDch is not equal to ILDca and an ILDch equation to flare out to 2.3dB at nyquist.

ILDch(f) >= ILDchmin(f) = 0.8 - 0.3 X 10E-9 (85A.XX)
ILDch(f) <= ILDchmax(f) = 0.8 + 0.3 X 10e9 (85S.XX)

Proposed Response
PROPOSED ACCEPT IN PRINCIPLE.

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>85A</td>
<td>85A.7</td>
<td>404</td>
<td>52</td>
<td>242</td>
</tr>
</tbody>
</table>

Misek, Brian Avago Technologies

Comment Type: T | Comment Status: D

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If the RF of the channel assembly is not improved as per a previous comment then the ILD of the channel must be increased. Reflections between the hosts and the connectors on the PC boards will create additional ripple over what is measure for the cable. The cable assembly is measured with better return loss connections then the host will provide and as such the informative overall channel ILD needs to be speced at a higher value than the cable.

The calculation can be performed as shown:

1. If one connect two 2-port networks described in terms of S-parameters
   \[ SC21 = SA21*SB21/(1-SA22*SB11) \]
   where (SXIJ being complex numbers)

2. For the channels we work with, generally the phases of SA22 and SB11 are not specified or even specifiable. Therefore we can approximate:
   \[ | correction| < 20*log10(e)*SA22*SB11 \]

Worst case the uncertainty will add directly to ILD. Some will argue that it should RSS with ILD which might be slightly optimistic.

3. Assuming return loss of the channel TP0-TP2 is 12dB at Nyquist and Cable assembly return loss at Nyquist is 5.7dB
   \[ | correction| < 1.133 \]
4. Making similar assumptions for TP3-TP5, gives a second correction.
   \[ | correction| < 1.133 \]
5. RSSing the 2 corrections with the specified ILD=1.73dB for the Cable assembly at Nyquist gives:
   \[ ILD TP0-TP5 = 2.3 dB \]

Suggested Remedy
 Change ILDch is not equal to ILDca and an ILDch equation to flare out to 2.3dB at nyquist.

ILDch(f) >= ILDchmin(f) = 0.8 - 0.3 X 10E-9 (85A.XX)
ILDch(f) <= ILDchmax(f) = 0.8 + 0.3 X 10e9 (85S.XX)

Proposed Response
PROPOSED ACCEPT IN PRINCIPLE.

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<thead>
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<td>404</td>
<td>52</td>
<td>242</td>
</tr>
</tbody>
</table>

Balasubramanian, Vittal FCI USA, Inc.

Comment Type: TR | Comment Status: D

ICRcalf shall be greater than or equal to ICRcamin as defined by the following equation where f is expressed in GHz.

This statement cannot be true. f needs to be in Hz or eqn 85A-12 needs to change to (f/5)

Suggested Remedy
 Change equation per comment

Proposed Response
PROPOSED ACCEPT IN PRINCIPLE.

[Editor's note: Late comment submitted after the ballot close; pending consideration by the Task Force]

Change "where f is expressed in GHz." to: "where f is expressed in Hz."

<table>
<thead>
<tr>
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<tbody>
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<td>85A</td>
<td>85A.7</td>
<td>405</td>
<td>3</td>
<td>212</td>
</tr>
</tbody>
</table>

Ghai, Ali Broadcom

Comment Type: TR | Comment Status: D

ICRcalf exceed ICRcfit, when worst case FEXT are included link budget are not supported at 10 m

Suggested Remedy
ICR channel min crossover ICRfit~400 MHz due to worst case aggressor FEXT which is not included in the diminico_01_0708 presentation.

see ghiasi_01_0709

Proposed Response
PROPOSED REJECT.

See remedy comment#170. Please note: In 10m analysis models measured FEXT disturber used for 3 disturber’s in power sum crosstalk calculation imposing worse case FEXT.

In 0.5 m analysis model worse case measured FEXT used; see diminico_02_1108.pdf.

<table>
<thead>
<tr>
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<td>405</td>
<td>3</td>
<td>212</td>
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</tbody>
</table>
Comment Type: E
Comment Status: D

Remove "<XREF>"

Suggested Remedy:
Change per comment

PROPOSED ACCEPT.

[Balasubramanian, Vittal, FCI USA, Inc.]

Comment Type: ER
Comment Status: D

Naming of return loss parameters is inconsistent with naming nomenclature used in IEEE 802 and most other industry specifications, including Infiniband, Fibre Channel, XFP, OIF CEI, where the term "return loss," not "reflection" is used. The only exception being SFp+. Given current thoughts on being able to implement -SR and -CR ports through same MDI, care should be taken on similar terminology. While "S21" was used in Clause 47, further searches found no usage of SDDmn parameters in IEEE 802.3 Section 4 or Section 5.

1. Table 86A-1, Line 22, "Differential output reflection response, SDD22"
2. Table 86A-1, Line 23, "Common mode output reflection response, SCC22"
3. Table 86A-2 "Differential input reflection response SDD11"
4. Table 86A-2 "Reflected differential to common mode conversion, SCD11"
5. Table 86A-3 "Differential Output Reflection Response SDD22"
6. Table 86A-3 "Common mode output reflection response, SCC2"
7. Table 86A-4 "Differential input reflection response, SDD11"
8. Table 86A-4 "Reflected differential to common mode conversion, SCD11"

Suggested Remedy:
1. Table 86A-1, Line 22, "Differential output reflection response, SDD22"
2. Table 86A-1, Line 23, "Common mode output reflection response, SCC22"
3. Table 86A-2 "Differential input reflection response SDD11"
4. Table 86A-2 "Reflected differential to common mode conversion, SCD11"
5. Table 86A-3 "Differential Output Reflection Response SDD22"
6. Table 86A-3 "Common mode output reflection response, SCC2"
7. Table 86A-4 "Differential input reflection response, SDD11"
8. Table 86A-4 "Reflected differential to common mode conversion, SCD11"

Make following changes:
1. change "Differential output reflection response, SDD22" to "Differential Output Return Loss"
2. change "Common mode output reflection response, SCC22" to "Common-mode Output Return Loss"
3. Change "Differential input reflection response SDD11" to "Differential Input Return Loss"
4. Change "Reflected differential to common mode conversion, SCD11" to "Differential to Common-mode Input Return Loss"
5. Change "Differential Output Reflection Response SDD22" to "Differential Output Return Loss"
6. Change "Common mode output reflection response, SCC2" to "Common-mode Output Return Loss"
7. Change "Differential input reflection response, SDD11" to "Differential Input Return Loss"
8. Change "Reflected differential to common mode conversion, SCD11" to "Differential to Common-mode Input Return Loss"

Add definition to 1.4:
Return Loss: the ratio (expressed in dB) of reflected power at one port to the incident power.
at the same port. May refer to optical power or to electrical power in a specified frequency range. Note that the dB measurement of return loss is the absolute magnitude of the respective s-parameter dB magnitude measurement.

**Proposed Response**

**Response Status** W

PROPOSED REJECT. There are three parts to the comment:

A. "return loss" vs "reflection"
B. Whether to mention the parameter symbol in the table entry.
C. Adding a definition for return loss.

For A: we are using S-parameters. XFP, SFP+ (module and connector), InfiniBand CXP and FC-PI-4 all use S-parameters (negative numbers). So do instruments, and the measurement data at http://ieee802.org/3/ba/public/channel.html Those who deal in small optical modules and/or compliance boards are used to this. Any change would be disruptive.


Some documents just call the parameters e.g. "Differential Output S-parameter" (from SFF-8083), some finesse the issue and by careful wordsmithing avoid calling an S-parameter a loss (e.g. SFF-8083, FC-PI-4).

The words used e.g. "reflection" and "response" are clear, correct, and consistent with S-parameters. "Coefficient" seems to be used more for a single-frequency response but can be considered.

52.6.1 has its signs and terminology straightforward: "Optical Return Loss Tolerance (max) 12 dB" Transmitter Reflectance (max) -12 dB

For B: we give other symbols where we have them, e.g. DDPWS, J2. It helps the reader.

As to adding a definition for return loss; 86A doesn't use the term. There is one already: 1.4.308 return loss: In 10BROAD36, the ratio in decibels of the power reflected from a port to the power incident to the port. An indicator of impedance matching in a broadband system. (See IEEE 802.3, Clause 11.)

This contradicts e.g. 11.3.1.2.1 where the return loss is positive. Clause 11 is no longer maintained. A parameter exists whether in dB or not.

If it helps 85 and 83A, could change 1.4.308 return loss to:
The ratio of the incident power at a port to the reflected power from that port; the inverse of reflection response. May refer to optical power or to electrical power in a specified frequency range. An indicator of impedance matching in a broadband system. (See IEEE 802.3.)

But would prefer to avoid writing pieces of a textbook if not necessary.

**Comment Type** E

**Comment Status** D

In Table 86-1, for Required operating range, ... 100 or OM3 ... should be ... 100 for OM3 ...

**SuggestedRemedy**

In Table 86-1, for Required operating range, change ... 100 or OM3 ... to ... 100 for OM3 ...

**Proposed Response**

**Response Status** W

PROPOSED ACCEPT.

**Comment Type** E

**Comment Status** D

In IEC document names, should we use hyphens (short) or minus signs/ en-dashes (medium length)?

**SuggestedRemedy**

Also look out for inconsistent hyphens and minus signs/ en-dashes in equations and 86A.5.3.1 p416 line 49, 86A.5.3.4 p418 line 42.

**Proposed Response**

**Response Status** W

PROPOSED ACCEPT IN PRINCIPLE. Find out and implement. May affect other clauses.

**Comment Type** E

**Comment Status** D

The phrase, "(bibliography, entries referenced here in the format [Bn])", is difficult to understand. Is there a typo?

**SuggestedRemedy**

Check that the phrase was written as intended and act accordingly.

**Proposed Response**

**Response Status** W

PROPOSED REJECT. References to the entries in Annex A take the form [B1], [B2] and so on.

**Comment Type** E

**Comment Status** D

The phrase, "(bibliography, entries referenced here in the format [Bn])", is difficult to understand. Is there a typo?

**SuggestedRemedy**

Check that the phrase was written as intended and act accordingly.

**Proposed Response**

**Response Status** W

PROPOSED REJECT. References to the entries in Annex A take the form [B1], [B2] and so on.
Previously, draft says "In this clause... an example item is numbered i." i is the usual example integer (while x is the usual example number on a continuous scale).

**Suggested Remedy**

Change x to i where appropriate. Affects 87, 88 also.

**Proposed Response**

**Response Status** W

PROPOSED ACCEPT IN PRINCIPLE. In clauses 80-88 and appendices if applicable, where x represents an integer, replace with italic i e.g. in IS_UNITDATA_x.request where x = 0 to n-1 FEC_uncorrected_blocks_counter_x Not in Figure 74-4, 74-6.

Clause editors to consider:

Which way for am_lock<x> and similar?

For "inst:IS_UNITDATA_y.request (y not necessarily equal to x)", use j in place of y? k in place of z?

Alternatively, make no change.

---

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

**Comment**

Figure 86-2. Why do you specify a lane i? Remove this lane decrease the drawing size and so that you don't need two "...".

The and gate symbol also looks bad.

**Suggested Remedy**

Remove lane i. Remove the overlap of the lines where they take a right angle into the AND gate.

Make the AND gate and optical receiver look pretty by removing overlapping lines.

**Proposed Response**

**Response Status** W

PROPOSED REJECT. Could remove lane 1 instead of lane i, don't see strong reason to do so as there are at least 4 lanes. Do lines overlap at high magnification or on a printout?
There is no Clause 45 register bit referenced for PMD_transmit_fault in this subclause.

**Suggested Remedy**

Delete the words "the MDIO is implemented, and" at the beginning of the first sentence.
Add the sentence: "If the MDIO interface is implemented, PMD_transmit_fault shall be mapped to the PMD_transmit_fault bit as specified in 45.2.1.7.4

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE. The PMD_transmit_fault variable is found in Table 86-4, which relates it to register/bit number 18.11 of the Status 2 register. It would be helpful if the register/bit number were clickable, but it is described in 45.2.1.7.4. So the information is there, in the format of 52, 87-88.

Insert "The PMD_transmit_fault function is optional." at the beginning of paragraph.

Compare 52, 68, 85 and 86.

In 45.2.1.7.4 and 45.2.1.7.5, add text for new PMDs.

In Table 86-5, the term, "Input optical power" is not defined, nor used elsewhere (except in this and similar tables in 87 & 88), nor needs definition as standard English is sufficient - except standard English does not need nor uses the underscores.

**Suggested Remedy**

In Table 86-5, change the term, "Input optical power" to "Input optical power" twice.
Repeat in tables 87-4 and 88-4.

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE. The term "Input optical power" isn't used otherwise, either.
Change "Input optical power <= -30 dBm average power" to "Average optical power at TP3 <= -30 dBm".
Change "Input optical_power >= stressed receiver sensitivity (max) in OMA" to "Optical power at TP3 >= stressed receiver sensitivity (max) in OMA".
Make similar changes in Table 87-4 and Table 88-4.

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

Why are 86.5.9 and others marked "(optional)" in the title while this, which says it's optional in the text, is not?

**Suggested Remedy**

Add "(optional)" here, at 87.5.7 and 88.5.7.

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE. Also consider if "(optional)" should be added to 86.5.8.
Comment Type TR  Comment Status D
Disabling any of the lanes of the PMD using the lane-by-lane disable function effectively disables the whole interface, since we haven't defined a mechanism by which an interface can operate without the full complement of lanes. Thus, the draft should include a warning, in the form of a note, that disabling one or more lanes will disable the interface, and can be disruptive to a network.

SuggestedRemedy
Add a note at the end of 86.5.8 that reads:

NOTE - Disabling the electrical transmitter on one or more lanes effectively disables the entire interface and can be disruptive to a network.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE. Follow response to 280.

Comment Type TR  Comment Status D
There is no Clause 45 register bit referenced for PMD_fault in this subclause.

SuggestedRemedy
Delete the words "the MDIO is implemented, and" at the beginning of the first sentence. Add the sentence: "If the MDIO interface is implemented, PMD_fault shall be mapped to the PMD_fault bit as specified in 45.2.1.2"

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE. Follow response to 280.

Comment Type TR  Comment Status D
In Table 86-6, increasing the Max limit for 'Average launch power, each lane' can enable lower cost transmitter implementations without significant impact on receivers if the current max 'Optical Modulation Amplitude (OMA), each lane' and max 'Peak power, each lane' are unchanged. Raising the Max limit for 'Average launch power, each lane' to 2.4 dBm will not compromise the eye safety class 1M limit of -5.3 dBm. See petrilla_02_0308 for eye safety discussion.

SuggestedRemedy
In Table 86-6, change the Max limit for 'Average launch power, each lane' from 1 to 2.4. In Table 86-7 change the max for 'Total average power for 40GBASE-SR4', from 7 to 8.4 and change the max for 'Total average power for 100GBASE-SR10, from 11 to 12.4. In Table 86-8, change min 'Damage threshold' from 2 to 3.4 and max 'Average power at receiver input, each lane' from 1 to 2.4.

Proposed Response Response Status W
PROPOSED ACCEPT.

Comment Type TR  Comment Status D
Condition of jitter tolerance test gives credit to the transmitter by allowing low frequency jitter <4 MHz to be tracked but the receiver is not test with the same tracked SJ. This is called double dipping!

SuggestedRemedy
Jitter tolerance is part of receiver sensitivity test and the same SJ taken creditly for must be tolerated.

As compromise I suggest 2 MHz for the corner frequency for the CRU and the jitter tolerance.

See ghiasi_02_0709

Proposed Response Response Status W
PROPOSED REJECT. [Page changed from 286] Either receiver corner frequency should remain at 4 MHz or it could be increased (but does not need to be). Needs coordination with nAUI (and GCrn).

Note also comments 168, 36, 175, 184, 183, 215, 224, 225.
Comment

Comment Type E  
Comment Status D

Why are there so many 1 sentence paragraphs in this subclause. One paragraph is cut in half by the table.

Suggested Remedy

Consolidate some of the paragraphs into longer sentences and make sure the paragraphs aren't divided over the table.

Proposed Response

PROPOSED ACCEPT IN PRINCIPLE. Move third paragraph to continue first. Look for a way to let a table float to the end of the page (Table 86-13). May be better to leave staff editor to tidy up when pagination is known.

Comment

Comment Type E  
Comment Status D

the effect of the effect of the decision circuit

Suggested Remedy

Change to the effect of the decision circuit

Proposed Response

PROPOSED ACCEPT.
**Comment Type** E  
*Comment Status* D  
"minimised" should be "minimized"  

**Suggested Remedy**  
Change "minimised" to "minimized"

**Proposed Response**  
PROPOSED ACCEPT.

---

**Comment Type** TR  
*Comment Status* D  
No Rx output criteria is established for the SRS test. While bit errors may be reported in system operation, there are occasions where a nPPI or nAUI interface may be exposed at the output of the Rx and it would be valuable to determine compliance at these interfaces.

**Suggested Remedy**  
Add another item, e, to the list of exceptions,  
e) Where nPPI or nAUI is exposed, a receiver is considered compliant if it meets the requirements in Annex 86A for nPPI or Annex 83B for nAUI.

**Proposed Response**  
PROPOSED ACCEPT IN PRINCIPLE. Add another item to the list of exceptions,  
e) Where nPPI or nAUI is exposed, a PMD receiver is considered compliant if it meets the nPPI module electrical output specifications at TP4 given in Table 86A-3 for nPPI, or the requirements in Annex 83B for nAUI.

---

**Comment Type** T  
*Comment Status* D  
With un-retimed modules, the meaning of compliant to stressed sensitivity is not always what it was when Clause 52 was written.

**Suggested Remedy**  
Add extra sentence:  
For a complete receive port, compliance means a BER of or better than 10^-12 under the conditions specified. For a PMD module, compliance means that the nPPI module electrical output specifications at TP4 given in Table 86A-3 are met.

**Proposed Response**  
PROPOSED ACCEPT IN PRINCIPLE. See response to 151.

---

**Comment Type** TR  
*Comment Status* D  
All graphs of dB in Annex86a are negative in magnitude. This is inconsistent with the equations, which show absolute magnitudes, as well as the rest of 802.3, which does not show negative numbers.

**Suggested Remedy**  
Definition for return loss created in other comment  
Add other definition for insertion loss in 1.4

**Proposed Response**  
Draft should refrain from using specific 4 port s-parameter names. n-Port s-parameters are becoming more common. Presentation given in May did not focus on port numbers, just the different types of modes, i.e. differential, common-mode, differential to common-mode, and common-mode to differential.

Redo equations as described above, and then replot all graphs so magnitudes are positive.

Sparameter port names should not be used for names of limit lines.

**Proposed Response**  
PROPOSED REJECT. Some other clauses define losses (positive, if no amplifiers being measured). This one, following XFP, FC-PI-4, InfiniBand, SFP+ and others, defines S-parameters, which are gains (see response to comment 327). As the other industry specifications which defined the compliance board methodology, it would be very disruptive to try to invert everything in 86A. This does not stop 85 continuing to use cable losses. Reflections and return losses are correctly signed in the optical clauses (e.g. 52).

As to adding a definition of insertion loss: would prefer to avoid writing pieces of a textbook if not necessary. If we have to, the ratio exists whether expressed in dB or not. Equating -3 dB (1/2) to +3 dB (2/1) is ambiguous and bad practice; anything expressed in dB must be properly signed.

Using the form  
parameter <=> limit (name) = equation

Needs two names each time, and is not necessary for the uses we make of these equations in 86A.
If "refrain from using specific 4 port s-parameter names" is referring to the form e.g. SDD22, all the similar documents (SFP+, FC-PI-4, InfiniBand, ...) that the editor has used recently do so. As long as we don't incorrectly label port numbers on figures, it seems widely acceptable.

As to "Sparameter port names should not be used for names of limit lines." limits are not named in 86A, inequalities are used to avoid dual naming.

### Table

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<th>Comment Type</th>
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<th>SC 86A.4</th>
<th>P 407</th>
<th>L 52</th>
<th># 59</th>
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<td>Force10 Networks</td>
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Per Comment 537: Rename PPI to nPPI with specific interfaces being XLPPI and CPPI.

This is interpreted as only using XLPPI / CPPI when discussing the specific interfaces. This has been partially implemented in Annex 86A.

1. P407, Line 7 "Parallel Physical Interface (XLPPI and CPPI) for 40GBASE-SR4 and 100GBASE-SR10"
2. P407, Line 49 "86A.4 Electrical specifications for XLPPI and CPPI"
3. P408, Line 4 "86A.4.1 XLPI and CPPI transmit side electrical specifications"
4. P 409, Line 36 "86A.4.2 XLPI and CPPI receive side electrical specifications"

**Suggested Remedy**

1. Change title to "Parallel Physical Interface (nPPI) for 40GBASE-SR4 and 100GBASE-SR10"
2. Change to "86A.4 Electrical specifications for nPPI"
3. Change to "86A.4.1 nPPI transmit side electrical specifications"
4. change to "86A.4.2 nPPI receive side electrical specifications"

**Proposed Response**

PROPOSED REJECT. May be appropriate for whole committee discussion. Note comment 297 on nAUI vs. XLAUI / CAUI.

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<td>Dawe, Piers</td>
<td>Avago Technologies</td>
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</table>

Subclause 86A.4.1 is titled "XLPPI and CPPI transmit side electrical specifications" Subclause 86A.4.2 is titled "XLPPI and CPPI receive side electrical specifications"

Reviewing figures 86-2 or 86-3, it is not clear where the "transmit side" or "receive side" is. Furthermore, the text is confusing as I believe there is a tx and rx associated with each side. So using the terminology "transmit" or "receive" side should be avoided.

86A.4.1.2 is a specification measured at TP4, which is not on the Tx side

**Suggested Remedy**

Instead of terminology "transmit side" use "nPPI Ingress" Instead of terminology "receive side" use "nPPI Egress"

Illustrate this terminology in either Fig 86-2 or 86-3

Building on this then, you would have a "nPPI Ingress Tx" and "nPPI Ingress Rx" and "nPPI Egress Tx" and "nPPI Egress Rx"

reorganize / reword according to below

86A.4.1 nPPI Ingress Electrical Specifications

Table 86A-1 change title to "nPPI Ingress Tx Output Electrical Specifications"
Move Table 86A-2 so it comes right after Table 86A-1 and rename it - "nPPI Ingress Rx Input Electrical Specifications"

86A.4.1.1 nPPI Ingress Tx Differential Output Return Loss and Ingress Rx Differential Input Return Loss

Change text to:
The magnitude of RLD in dB for nPPI Ingress Tx Differential Output Return Loss measured at TP1a and nPPI Ingress Rx Differential Input Return Loss measured at TP1 shall be greater than RLDmin as defined in Equation 86A-1 for frequencies from 10 MHz to 11.1 GHz. The equation is illustrated in Figure 86A-1.

RLD(f) > RLDmin = \( \text{[show equations]} \)

where f is frequency in gigahertz

86A.4.1.2 nPPI Ingress Tx Common-mode Output Return Loss

The magnitude of RLC in dB for nPPI Ingress Tx Common-mode Output Return Loss measured at TP1a shall be greater than RLCmin as defined in Equation 86A-2 for frequencies from 10 MHz to 11.1 GHz. The equation is illustrated in Figure 86A-1.

RLC(f) > RLCmin = \( \text{[show equations]} \)

where f is frequency in gigahertz

---

**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: Clause, Subclause, page, line**
86A.4.1.3 nPPI Ingress Rx Differential to Common-mode Input Return Loss
The magnitude of RLCD in dB for nPPI Ingress Rx Differential to Common-mode Input Return Loss measured at TP1 shall be greater than RLCmin as defined in Equation 86A-x for frequencies from 10 MHz to 11.1 GHz. The equation is illustrated in Figure 86A-1.

\[ \text{add equation } RLCD > RLCmin = 10\text{dB} \]

86A.4.2 nPPI Egress Electrical Specifications
Rename Table 83A-3 to “nPPI Egress Tx Electrical Output Specifications”
Rename Table 83A-4 to “nPPI Egress Rx Electrical Input Specifications”

86A.4.2.1 nPPI Egress Tx Differential Return Loss and Egress Rx Differential Return Loss
Change text to:
The magnitude of RLCD in dB for nPPI Egress Rx Differential to Common-mode Input Return Loss measured at TP4a shall be greater than RLCmin as defined in Equation 86A-1 for frequencies from 10 MHz to 11.1 GHz. The equation is illustrated in Figure 86A-1.

86A.4.2.2 nPPI Egress Tx Common-mode Output Return Loss
The magnitude of RLC in dB for nPPI Egress Tx Common-mode Output Return Loss measured at TP4 shall be greater than RLCmin as defined in Equation 86A-2 for frequencies from 10 MHz to 11.1 GHz. The equation is illustrated in Figure 86A-1.

86A.4.2.3 nPPI Egress Rx Differential to Common-mode Input Return Loss
The magnitude of RLC in dB for nPPI Egress Rx Differential to Common-mode Input Return Loss measured at TP4a shall be greater than RLCmin as defined in Equation 86A-x for frequencies from 10 MHz to 11.1 GHz. The equation is illustrated in Figure 86A-1.

Move Fig 86A-1 to after Table 86A-04
Change Caption to Return Loss Specifications
In Figure
Change “SCC22” to “RLCDMIN”
Change “SDD11 or SDD22” to “RLCDMIN”
Change SCD11” to “RLCDMIN”

Proposed Response Response Status W
PROPOSED REJECT. It is clear. Like any other sublayer or interface, there is a transmit side and a receive side (e.g. 82.2.5 Transmit process, 82.2.17 Receive process, “Each PMA remaps the PCSLs from m PMA input lanes to n PMA output lanes in the Tx direction, and from n PMA input lanes to m PMA output lanes in the Rx direction.”) As noted in D2.0 comment 470, the transmit path is down the stack, PMA to MDI, and the receive path is up the stack, MDI to PMA. Neither P802.3ba/D2.1 nor 802.3 Section 4 uses “ingress” or “egress”.

Ghiasi, Ali Broadcom
Proposed Response
Comment Type TR Comment Status D
XLPI and CPPI has no TP0 definition missing

SuggestedRemedy
propose to add table similar to SFF-8431 table 26 to the clause
Differential Output Voltage, see note 1
Termination mismatch at 1 MHz, 5%
Single ended output voltage range, -0.3 to 4 V
Output rise and fall time, 24 ps min
Output AC common mode, 12 mV max
SDD22, 0.01-2.8GHz -12 dB and -8.55 13.33log10(f/5.5), with f in GHz
SCC22, 0.01-2.8GHz -9 dB and -6.1 + log10(f/5.5) from 2.8 to 11 GHz

Proposed Response
Response Status W
PROPOSED REJECT. See response to comment 221.

Ghiasi, Ali Broadcom
Proposed Response
Comment Type TR Comment Status D
XLPI and CPPI has no TP5 definition missing

SuggestedRemedy
propose to add table similar to SFF-8431 table 27 to the clause
Max input differential voltage swing, 850 mV
Input AC common mode, 15 mV max
SDD11, 0.01-2.8GHz -12 dB and -8.55 13.33log10(f/5.5), with f in GHz
SCD11, from 0.01 to 11.1 GHz -15 dB

Proposed Response
Response Status W
PROPOSED REJECT. There has up until now been no request for such, and comment does not explain why a change might be desirable. Any table would be a recommendation only, and could go in 86A.6 Recommended electrical channel, renamed.

Ghiasi, Ali Broadcom
Proposed Response
Cl 86A SC 86A.4.1 P 408 L 20 # 56
Dawe, Piers Avago Technologies

Comment Type T
Comment Status D

If Table 86A-3, nPPI module electrical output specifications at TP4, has a termination mismatch spec, why doesn't Table 86A-1, nPPI host electrical output specifications at TP1a?

Suggested Remedy
Add row, Termination mismatch at 1 MHz, max 5%

Proposed Response
Response Status W
PROPOSED ACCEPT. Check with experts first.

Cl 86A SC 86A.4.1 P 408 L 24 # 57
Dawe, Piers Avago Technologies

Comment Type T
Comment Status D

If Table 86A-3, nPPI module electrical output specifications at TP4, has an output transition time spec, why doesn't Table 86A-1, nPPI host electrical output specifications at TP1a? Up to a point, if the host emits edges that are too fast, it suffers its own crosstalk (because the connector is on the host), but a compliant module may reflect and convert more of the high frequency signal than test equipment, giving worse performance in the field than expected from testing.

Suggested Remedy
Add row, Output transition time, 20% to 80% min 28 ps. This is easier for the host than SFP+ 34 ps.

Proposed Response
Response Status W
PROPOSED ACCEPT. Check with experts first.

Cl 86A SC 86A.4.1 P 408 L 30 # 216
Ghiasi, Ali Broadcom

Comment Type TR
Comment Status D

If the transmitter has very low RJ-0 then DDJ will approach J2 or 0.18 UI due to over emphasis. Over emphasis can result in severe eye degradation depending on the laser driver gain, etc.

Suggested Remedy
To protect against these over-emphasis scenarios DDJ must be added with propose value of 0.12 UI.

Proposed Response
Response Status W
PROPOSED REJECT. See response to comment 216.

Cl 86A SC 86A.4.1 P 410 L 13 # 61
Dawe, Piers Avago Technologies

Comment Type E
Comment Status D

Font size of the minus sign before 10

Suggested Remedy
Fix. Also p411 line 13. Centre-justify "-10" there.

Proposed Response
Response Status W
PROPOSED ACCEPT.

Cl 86A SC 86A.4.1 P 410 L 19 # 218
Ghiasi, Ali Broadcom

Comment Type TR
Comment Status D

If the transmitter has very low RJ-0 then DDJ will approach J2 or 0.18 UI due to over emphasis. Over emphasis can result in severe eye degradation depending on the laser driver gain, etc.

Suggested Remedy
To protect against these over-emphasis scenarios DDJ must be added with propose value of 0.12 UI.

Proposed Response
Response Status W
PROPOSED REJECT. See response to comment 216.

Cl 86A SC 86A.4.1 P 410 L 20 # 55
Dawe, Piers Avago Technologies

Comment Type E
Comment Status D

DDPWS min. seems wrong.

Suggested Remedy
Change to DDPWS tolerance (still min.).

Proposed Response
Response Status W
PROPOSED ACCEPT.
At the last meeting we considered reducing the upper limit of required (or recommended) S-parameter compliance from 11.1 GHz to 10.4 GHz. I don't think we considered the compromise suggested below.

**Suggested Remedy**

For nPPI host, module and channel, reduce the upper limit of required (or recommended) S-parameter compliance from 11.1 GHz to 10.4 GHz. But for the compliance boards, do not reduce the limit.

**Proposed Response**

PROPOSED ACCEPT.

---

SCC22 at TP1a and TP4 isn't an XLPPI and CPPI transmit side electrical specification, as it's not on the transmit side. We have referred to 86A.5.1 in each of the previous three sections.

**Suggested Remedy**

Change to:

86A.4.1.2 Common mode output reflection response SCC22 at TP1a
From 10 MHz to 11.1 GHz, the magnitude in decibels of the host common mode output reflection response SCC22 at TP1a shall not exceed the limit given in Equation 86A-2 and illustrated in Figure 86A-1.

Create new:

86A.4.2.2 Common mode output reflection response SCC22 at TP4
From 10 MHz to 11.1 GHz, the magnitude in decibels of the module common mode output reflection response SCC22 at TP4 shall not exceed the limit given in Equation 86A-2 and illustrated in Figure 86A-1.

Revised PICS to follow changes.

**Proposed Response**

PROPOSED ACCEPT.

---

Is this eye mask is a condition of the host electrical receiver signal tolerance test?

**Suggested Remedy**

If so, re-order table rows to reflect this.

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE. Move "Conditions of host electrical receiver signal tolerance test" above "Eye mask coordinates".
<table>
<thead>
<tr>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
<th>Proposed Response</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>TR</td>
<td>D</td>
<td>Change max to target value</td>
<td>PROPOSED ACCEPT IN PRINCIPLE. The column sub-header is &quot;Specification values&quot;. See response to comment 54 which will make this clearer.</td>
<td>W</td>
</tr>
<tr>
<td>T</td>
<td>D</td>
<td>Need to confirm transition time value and provide DDPWS value.</td>
<td>PROPOSED ACCEPT IN PRINCIPLE. Note comment 219.</td>
<td>W</td>
</tr>
<tr>
<td>E</td>
<td>D</td>
<td>Put the categories in the same order as elsewhere in the clause.</td>
<td>PROPOSED ACCEPT.</td>
<td>W</td>
</tr>
<tr>
<td>TR</td>
<td>D</td>
<td>DDPWS value is TBD</td>
<td>PROPOSED ACCEPT IN PRINCIPLE. For discussion. Note comment 53.</td>
<td>W</td>
</tr>
</tbody>
</table>

It is unclear which equation (86A-6 and 86A-7) goes with HCB and MCB. This is also true for 86A-8 and 86A-9.

Add clarifying text with equations 86A-6 and 86A-7, so it is clear which equation goes to HCB and MCB respectively.

Also, do for 86A-8 and 86A-9.

Add clarifying text with equations 86A-6 and 86A-7, so it is clear which equation goes to HCB and MCB respectively.
Comment Type: T  Comment Status: D

How much loss does the connector introduce?

1. Subtracting Equations (86A-4) and (86A-5) from (86A-6) for the combined MCB and HCB implies a connector loss (plus other impairments) of 0.87 dB at 5.15625 GHz.

2. Subtracting Equation (86A-4) and 3.5 dB from Equation (86A-20) for the TP0 to TP1a (or TP4a to TP5) channel implies a connector (plus other impairments) loss of 0.54 dB at 5.15625 GHz.

Upon first glance, one would assume you could do better with the controlled environment of the HCB and MCB but equations seem to reflect the opposite.

Suggested Remedy

Update the equations to exhibit improved consistency or explain why they don’t need to be consistent.

Proposed Response: W

PROPOSED ACCEPT IN PRINCIPLE. Equations 86A-4 and 86A-5 give the nominal responses for "If boards are used which do not match the specifications given, the measurement results for nPPI shall be corrected for the differences between the actual HCB or MCB’s properties and the reference through responses (SDD21) given below" at line 19. 86A-6 gives a spec on actual response of a pair for "Boards that do not meet the specifications for mated HCB-MCB shall not be used.” The difference is for the connector and also tolerances on the MCB and HCB. The SFP+ connector spec is 0.58 dB at 5.15625 GHz. Change “below” to “in 86A.5.1.1.1”, change "outside the limits" to "outside the limits given in 86A.5.1.1.2", change "HCB-MCB shall" to "HCB-MCB in 86A.5.1.1.2 shall".
Do we have measurements on QSFP and CXP mated HCB-MCB reflection response?

**Suggested Remedy**
If so, update equations 86A-8 and 86A-9. If appropriate, combine into a single limit. Update Figure 86A-2 to match.

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE. Requesting measurements on QSFP and CXP mated HCB-MCB reflection response. If not available, remove Equation 86A-8 and use 86A-9 for both looking into the HCB and looking into the MCB. Update text and Figure 86A-4.

Cleaning up terminology: the NEXT specs apply from receive side to transmit side (crosstalk that would go from module back to module) as much as vice versa.

**Suggested Remedy**
Change "from any transmit lane to any receive lane or vice versa" to "from any input lane to any output lane on the same compliance board or vice versa."

On next page, change "between one transmit lane and another, or between one receive lane and another" to "between any lane and any other co-propagating lane", change "from all but one transmit lanes to any receive lane or vice versa," to "from all but one of a group of 4 or 10 lanes to any counter-propagating lane or vice versa".

The last "or vice versa" doesn't need to be kept but is this an easier way to do the measurement?

**Proposed Response**

PROPOSED ACCEPT.

**Title of Fig 86A-4 uses inconsistent name, as noted in other comments.**

**Suggested Remedy**
Change title of Fig 86A-4 to "Return Loss Limits for mated HCB-MCB"

**Proposed Response**

PROPOSED REJECT. S-parameters define responses (gains) not losses.
<table>
<thead>
<tr>
<th>Comment Type</th>
<th>Suggested Remedy</th>
<th>Proposed Response</th>
<th>Response Status</th>
<th>Comment Status</th>
<th>Comment Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>TR</td>
<td>The numerator of Zp-Zn could be negative</td>
<td>Add absolute value</td>
<td>W</td>
<td>D</td>
<td>222</td>
</tr>
<tr>
<td>E</td>
<td>In this clause</td>
<td>In this annex</td>
<td>W</td>
<td>D</td>
<td>65</td>
</tr>
<tr>
<td>E</td>
<td>At present, we don't have a transition time spec on an optical signal</td>
<td>Delete &quot;This applies to electrical signals as well as optical signals.&quot;</td>
<td>W</td>
<td>D</td>
<td>66</td>
</tr>
<tr>
<td>E</td>
<td>It may</td>
<td></td>
<td>W</td>
<td>D</td>
<td>67</td>
</tr>
<tr>
<td>E</td>
<td>At present, we don't have a transition time spec on an optical signal</td>
<td>Leave the first &quot;shall&quot;, in 86A.5.3.8. In the rest of 86A.5.3, change &quot;shall be&quot; to &quot;is&quot; or &quot;are&quot;, &quot;shall have&quot; to &quot;has&quot;, &quot;shall not exceed&quot; to &quot;does not exceed&quot;, &quot;shall transmit&quot; to &quot;transmits&quot;. Change &quot;The BER shall remain below 10-12.&quot; to &quot;The BER of a compliant host receiver remains below 10-12.&quot;</td>
<td>W</td>
<td>D</td>
<td>68</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: Clause, Subclause, page, line
IEEE P802.3ba D2.1 40Gb/s and 100Gb/s Ethernet comments

Cl 86A SC 86A.5.3.8.3 P 420 L 50 # 70
Dawe, Piers Avago Technologies

Comment Type E Comment Status D
Terminology: these things aren't jitter. ISI is an effect not a form of jitter. Later we have "ISI jitter" then "high probability jitter" for apparently the same thing.

Suggested Remedy
Clean up the terminology in 86A.5.3.8. Spelling out "RSS" if necessary.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE. Clean up the terminology in 86A.5.3.8. Spell out "RSS".

Cl 86A SC 86A.5.3.8.3 P 421 L 42 # 69
Dawe, Piers Avago Technologies

Comment Type E Comment Status D
A voltage stress before the limiter function is to be applied.

Suggested Remedy
A voltage stress is to be applied before the limiter function.

Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 86A SC 86A.5.3.8.5 P 422 L 28 # 160
Petrilla, John Avago Technologies

Comment Type E Comment Status D
The text calls for, 'the intrinsic jitter of the test source due to intrinsic noise and finite bandwidth effects is measured and calibrated'. If intrinsic, it seems unlikely that it can be calibrated.

Suggested Remedy
Change, 'is measured and calibrated' to 'is measured'.

Proposed Response Response Status W
PROPOSED ACCEPT.

Cl 86A SC 86A.6 P 423 L 44 # 517
D'Ambrosia, John Force10 Networks

Comment Type TR Comment Status D
Per Figure 86-3, "TP1 and TP4" should be "TP1a and TP4a".

Suggested Remedy
Per comment.

Proposed Response Response Status W
PROPOSED ACCEPT. See response to comment 317.
<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>86A</td>
<td>86A.6</td>
<td>424</td>
<td>31</td>
<td>223</td>
</tr>
<tr>
<td>87</td>
<td>87.11.1</td>
<td>317</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

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

Based on input from several OEMs 3.5 dB of PCB trace is not sufficient for most applications as the reach on FR4-6 is only about 4", but QSFP and CXP have very difficult routing on the front contacts.

**Suggested Remedy**

Propose to increase the host PCB loss from 3.5 dB to 5 dB, the back to back loss will increase compared to SFP by 0.5 dB due to 0.2 dB MCB loss increase and 0.3 dB HCB loss increase.

SDD21 = \(-0.7 \text{ dB} \) from 0.01 to 0.2 GHz

\(-0.116 - 0.91*\text{sqrt}(f) - 0.864*f\) from 0.2 to 7 GHz

\(36.52 - 6.44*f\) from 7 to 8 GHz

\(-15\) from 8 to 11 GHz

**Proposed Response**  **Response Status** W

PROPOSED ACCEPT IN PRINCIPLE. Check the proposed new limit first.

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>86A</td>
<td>86A.8.4</td>
<td>427</td>
<td>20</td>
<td>52</td>
</tr>
<tr>
<td>87</td>
<td>87.12.4.3</td>
<td>321</td>
<td>37</td>
<td>87</td>
</tr>
</tbody>
</table>

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

"PICS proforma tables for" should match annex title.

**Suggested Remedy**

Change "Physical Medium Dependent (PMD) sublayer and medium, types 40GBASE-SR4 and 100GBASE-SR10" to "Parallel Physical Interface (XLPPI/CPPI) for 40GBASE-SR4 and 100GBASE-SR10".

**Proposed Response**  **Response Status** W

PROPOSED ACCEPT. Be consistent with resolution of 316.

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

Incorrect table column heading. Anyway, the column heading is not the place for a list of fibre types. When you have a single column of spec limits (as here) the heading should be "Value" (see clauses 68, 85, 86 for examples). When there are two options (as in Table 88-1 and Table 88-18), the heading distinguishes between them.

**Suggested Remedy**

For Table 87-1, change "40GBASE-LR4" to "Status". Could change title to "Clauses and sublayers for 40GBASE-LR4" if wished. For Table 87-7, 8, 9 and 14, change "40GBASE-LR4" to "Value". Could add "for 40GBASE-LR4" to title of Table 87-14.

For Table 87-15, change "Type B1.1, B1.3 SMF" to "Value". Could add "for 40GBASE-LR4" to title.

For Table 87-7, 8, 9, 11, 12, and 13, see another comment (combine the tables) or change "100GBASE-LR4" or "100GBASE-ER4" to "Value".

For Table 88-19, change "Type B1.1, B1.3 SMF" to "Value".

**Proposed Response**  **Response Status** W

PROPOSED ACCEPT IN PRINCIPLE.

Leave Table 87-1 unchanged.

Table 87-7, 8, 9 and 14, change "40GBASE-LR4" to "Value"

Change Title of Table 87-14 to "Fiber optic cabling (channel) characteristics for 40GBASE-LR4"

In Table 87-15, change "Type B1.1, B1.3 SMF" to "Value"

Change Title of Table 87-15 to "Optical fiber and cable characteristics for 40GBASE-LR4"

For Table 88-7, 8, 9, 11, 12, and 13, see response to comment 90

In Table 88-19, change "Type B1.1, B1.3 SMF" to "Value"

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

As these are mandatory,

**Suggested Remedy**

Delete "N/A [ ]" twice.

**Proposed Response**  **Response Status** W

PROPOSED REJECT. Follows other clauses (eg 52), allows devices that only contain an Ethernet compatible Tx or Rx (but not both).
The text "An upper bound to the delay through the PMA and PMD is required for predictable operation of the MAC Control PAUSE operation." is a leftover from 10G where the PMA and PMD delays are specified in combination. In 40G and 100G, they are specified separately. The text could give the impression that controlling the delay through the PMA and PMD determines predictable operation of the MAC Control PAUSE operation, which is not true; above a very few 100 m, delay is dominated by the medium, and the FEC, PCS and RS are also involved. 87 and 88 should not be talking about what the PMA delay should be or why; PMA delay is addressed in 83.5.4. Note another comment for a similar issue in other clauses.

**Suggested Remedy**
Delete the sentence, here and in 88.3.1.

**Proposed Response**
Response Status: W
PROPOSED ACCEPT IN PRINCIPLE
See response to comment 29.

---

Wrong reference.

**Suggested Remedy**
Replace "See 80.3." with "See 80.4.".

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

---

If you resize the columns the heading row will fit on one line.

**Suggested Remedy**
Select table, resize columns to contents, then resize to 432 points total. Also Table 88-2.

**Proposed Response**
Response Status: W
PROPOSED ACCEPT IN PRINCIPLE.
### Comment on 40GBASE-LR4

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

For 40GBASE-LR4, the TDP limit for the transmitter and the allowance for penalties are the same, at 2.3 dB, but the VECP for the receiver stressed sensitivity test is much lower, 1.6 dB. This is a bigger difference than for other single-mode PMDs, and a significantly lower VECP than in Clause 52.

**Suggested Remedy**

Increase the VECP to e.g. 2 dB and increase the stressed receiver sensitivity (OMA) in step.

**Proposed Response**

**Response Status**: W  
PROPOSED REJECT.

802.3ba link budgets (e.g. TDP vs Tx OMA trade offs) are based on the TDP value being a good measure of the penalty the module receiver would see with a given transmitter over a worst case link.

The module receiver has to provide enough link budget whether the Tx has max or min TDP. The SRS test specifies a TDP value (1.6dB) at which minimum Tx OMA is at the mid point of its allowed range, and the required receiver sensitivity (to meet link budget) is also at the midpoint of its range. It would be burdensome to test SRS corresponding to every possible TDP value and there's no justification for measuring SRS at a single extreme of the required receiver sensitivity range.

Previous successful Ethernet spec's show this approach to be reasonable and effective.

---

### Comment on Table 87-11

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

Table 87-11. Footnote refers to the wrong subclause.

**Suggested Remedy**

Replace 87.8.10 with 87.8.11.

**Proposed Response**

**Response Status**: W  
PROPOSED ACCEPT.
An SRS test is needed that system companies can use to qualify an optic. The test that component vendors do might be more complicated, but there should be a clear relation so that if a system company finds a part fails, the component vendor will too. Furthermore, the system company should not have to disassemble the part. The standard does not provide test plans, but the standard should lead to compatible test plans between system companies, their vendors, and even a system company’s customers. The standard should not be written such that disparate interpretations are fostered leading to different quantitative results with no clear relation.

Suggested Remedy
See technical presentation to be submitted by a group of supporters reducing the number of tunable transmitters among other changes.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
see response to comment 143

The current Stressed Receiver Test (based on LX4 methodology) is not rigorous, unlikely to be implemented in practice, and complete specification of the test is scattered across many clauses and subclauses. A modified SRS test is proposed which uses either of 2 options:

1) input signals are tuned to the wavelengths of worst insertion loss for the channel under test, and worst case crosstalk penalty for the other channels.

or

2) input signals are at nominal wavelengths and input channel levels are adjusted to account for channel insertion loss ripple for the channel under test and crosstalk variation for the other channels.

A presentation will be available to the task force which describes the details of the proposed new SRS test, also a Frame document with a draft section describing the proposed new SRS test will be available.

Suggested Remedy
Remove references and sub clauses to current SRS test. Insert new SRS subclause section describing a modified SRS test which uses either of 2 options:

1) input signals are tuned to the wavelengths of worst insertion loss for the channel under test, and worst case crosstalk penalty for the other channels.

or

2) input signals are at nominal wavelengths and input channel levels are adjusted to account for channel insertion loss ripple for the channel under test and crosstalk variation for the other channels.

A presentation describing the details of the proposed new SRS test, and a Frame document with a draft section describing the proposed new SRS test will be available.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.
Presentation contained in cole_01_0709, Detailed proposal contained in king_01_0709
Comment Type | T | CL 87 | SC 87.8.11 | P 314 | L 29 | # | 85
---|---|---|---|---|---|---|---
Comment Status | D | Dawe, Piers | Avago Technologies

"may be sent" but sending something isn't discretionary. Editorials.

Suggested Remedy
Change "Test patterns 3 or 5, or valid 40GBASE-R bit streams may be sent from the transmit section of the receiver under test." to
Pattern 3 or Pattern 5, or a valid 40GBASE-R4 or 100GBASE-R10 signal is sent from the transmit section of the PMD under test.
Also 88.9.10.

Proposed Response | W | PROPOSED ACCEPT IN PRINCIPLE
In 87.8.11 change "Test patterns 3 or 5, or valid 40GBASE-R bit streams may be sent from the transmit section of the receiver under test" to
"Pattern 3 or Pattern 5 or a valid 40GBASE-R signal is sent from the transmit section of the PMD under test"

In 88.9.10 change "Pattern 3 or Pattern 5 or a valid 100GBASE-R signal may be sent from the transmit section of the receiver under test" to
"Pattern 3 or Pattern 5 or a valid 100GBASE-R signal is sent from the transmit section of the PMD under test"

Comment Type | T | CL 87 | SC 87.8.3 | P 311 | L 30 | # | 66
---|---|---|---|---|---|---|---
Comment Status | D | Dawe, Piers | Avago Technologies

"The data being transmitted": test patterns aren't data.

Suggested Remedy
Change "The data being transmitted is asynchronous to the received data." to
"The signal being transmitted is asynchronous to the received signal."

Proposed Response | W | PROPOSED ACCEPT.

Comment Type | T | CL 87 | SC 87.8.4 | P 311 | L 37 | # | 73
---|---|---|---|---|---|---|---
Comment Status | D | Dawe, Piers | Avago Technologies

When an international reference is sufficient, that's all we give; maintaining multiple dual references (IEC or ITU-T and TIA) would be too onerous. TIA/EIA-455-95-A and IEC 61280-1 is not in the references nor referred to in 86.8.4.1. I believe that TIA/EIA-455-127-A is a better (more up-to-date) reference for spectral width.

Suggested Remedy
Either delete "IEC 61280-1-3", here and in 88.9.2 (and PICS) or add it to 1.3 Normative references.

Proposed Response | W | PROPOSED ACCEPT.

Comment Type | T | CL 87 | SC 87.8.3 | P 311 | L 32 | # | 74
---|---|---|---|---|---|---|---
Comment Status | D | Dawe, Piers | Avago Technologies

Saying "An optical spectrum analyzer (OSA) or equivalent instrument is used" might be just fluff, or introducing terminology that isn't used, or duplicating the normative reference(s), or contradicting the normative reference(s). It's not necessary.

Suggested Remedy
Delete "An optical spectrum analyzer (OSA) or equivalent instrument is used and", here and in 88.9.2.

Proposed Response | W | PROPOSED ACCEPT.

Comment Type | T | CL 87 | SC 87.8.3 | P 311 | L 32 | # | 74
---|---|---|---|---|---|---|---
Comment Status | D | Dawe, Piers | Avago Technologies

Maintaining multiple dual references (IEC or ITU-T and TIA) is too onerous. IEC 61280-1-3 is not in the references nor referred to in 86.8.4.1. I believe that TIA/EIA-455-127-A is a better (more up-to-date) reference for spectral width.

Suggested Remedy
Either delete "IEC 61280-1-3", here and in 88.9.2 (and PICS) or add it to 1.3 Normative references.

Proposed Response | W | PROPOSED ACCEPT.

Comment Type | T | CL 87 | SC 87.8.3 | P 311 | L 32 | # | 74
---|---|---|---|---|---|---|---
Comment Status | D | Dawe, Piers | Avago Technologies

Add reference to IEC 61280-1-3 in clause 1.3:

Proposed Response | W | PROPOSED ACCEPT.

Comment Type | T | CL 87 | SC 87.8.3 | P 311 | L 32 | # | 74
---|---|---|---|---|---|---|---
Comment Status | D | Dawe, Piers | Avago Technologies

When an international reference is sufficient, that's all we give; maintaining multiple dual references (IEC or ITU-T and TIA) would be too onerous. TIA/EIA-455-95-A and IEC 61280-1-1 are believed to be equivalent. 86.8.4.2 refers to the latter only.

Suggested Remedy
Either delete "TIA/EIA-455-95-A", here and in 88.9.3 (and PICS).

Proposed Response | W | PROPOSED REJECT.

Dual references were the accepted remedy to a comment on draft 2.0
In the following, "should" is too weak for a definition. "Instantaneous decision sampling" is utopian. The reference transmitter... should meet the following basic requirements:
RIN should be minimized to less than -136 dB/Hz. The reference receiver should have bandwidth...
The sensitivity of the reference receiver should be limited...
The receiver should have minimal...
Decision sampling should be instantaneous with minimal uncertainty and setup/hold properties.
The sensitivity S... It should be measured while...

Suggested Remedy
Change to
The reference transmitter... meets the following basic requirements:
The rise/fall times are less than...
RIN is less than -136 dB/Hz and should be minimized to .
The reference receiver has the bandwidth...
The sensitivity of the reference receiver is limited...
The receiver has minimal...
Decision sampling has minimal uncertainty and setup/hold properties.
The sensitivity S... It is measured while...

Proposed Response

PROPOSED ACCEPT IN PRINCIPLE
In 87.8.6.1 and 88.9.5.1
Change "It should meet the following basic requirements" To "The basic requirements are:"
Change "The rise/fall times should be less than"
To "Rise/fall times of less than"
Change "RIN should be minimized to less than"
To "RIN of less than"

In 87.8.6.3 and 88.9.5.3
Change "The reference receiver should have the bandwidth"
To "The reference receiver is required to have the bandwidth"
Change "The sensitivity of the reference receiver should be limited by"
To "The sensitivity of the reference receiver is limited by"
Change "The receiver should have minimal"
To "The receiver has minimal"

Draft says "The channel provides a maximum optical return loss specified in Table 87-12." Table says "Optical return loss (max)". Hence tester is allowed to provide a lower optical return loss, which would tend to fail compliant transmitters, or the transmitter implementer has an unknown but over-onerous target to meet. Neither is acceptable. So this isn't a "max" at all, it's a test condition. Similarly, the amount of dispersion is unbounded.

Suggested Remedy
Replace "a maximum" with "the", delete "(max)", delete "at least" twice. Same in 88.9.5.2.

Proposed Response

PROPOSED ACCEPT IN PRINCIPLE
The required amount of dispersion is clearly bounded.
In Tables 87-12 and 88-16 change "Optical return loss (max)" to "Optical return loss"
In 87.8.6.2 and 88.9.5.2
Change "The channel provides a maximum optical return loss" to "The channel provides an optical return loss"
As there are now three exceptions,

SuggestedRemedy

Lay out as a lettered list:
The RIN measurement methodology is defined in 52.9.6 with these exceptions:

a) The optical return loss...

b) Each lane may...

c) The upper -3 dB...

Also 88.9.7.

PROPOSED ACCEPT IN PRINCIPLE.

In 87.8.8 and 88.9.7 change "The RIN measurement methodology is defined in 52.9.6 with the exception that the optical..." to

"The RIN measurement methodology is as defined in 52.9.6 with the following exceptions:

a) The optical return loss is 20 dB.

b) Each lane may be tested individually with the sum of the optical power from all of the lanes not under test being below -30 dBm, or if other lanes are operating, a suitable optical filter may be used to separate the lane under test. Also, the upper -3 dB limit of the measurement apparatus is to be approximately equal to the signaling rate (i.e.,"

To

"The RIN measurement methodology is as defined in 52.9.6 with the following exceptions:

88.7 PMD to MDI optical specifications for 100GBASE-LR4 and 88.8 PMD to MDI optical specifications for 100GBASE-ER4 have the same structure, tables with all the same rows bar two, and almost identical text. Many of the spec numbers differ, of course. Also, unlike Clause 52, these PMDs are interoperable. It would be much easier for the reader to take in, and observe the similarities and differences, if the sections were combined, as 10GEPON 75.4 for example has done.

SuggestedRemedy

Combine the two sections. Combine Table 88-6 and 88-10, and so on.

PROPOSED ACCEPT IN PRINCIPLE.

Combine the two sections with editorial licence.
**Comment Type T**  
**Comment Status D**  
We should not qualify units: a UI or volt or whatever cannot be peak-to-peak, it's just a unit. The parameter measured in UI or volts or whatever might be defined in a peak-to-peak way, but is this one? I assume what is intended by "Stressed eye jitter" is the stressed eye jitter. J of 52.9.9.2, which is J2, from the 0.5th to the 99.5th percentile not from peak to peak. But 88.9.10 Stressed receiver sensitivity refers to 53.9.12, 53.9.15 and 53.9.14, none of which has a "Stressed eye jitter". 53 wasn't intended for 64B/66B use.

**SuggestedRemedy**  
1. Remove "pk-pk", here and in Table 88-12.  
2. In 88.9.10 and 87.8.11, define stressed sensitivity by reference to 52.9.9 for the signal characteristics and calibration, not 53.9.12.2.

**Proposed Response**  
**Response Status W**  
PROPOSED ACCEPT IN PRINCIPLE.  
Remove "pk-pk" in Table 88-8 (and 88-12 if tables not combined due to comment 90).

For definition of stressed sensitivity see response to comment 143.

**Comment Type ER**  
**Comment Status D**  
Footnote refers to the wrong subclause.

**SuggestedRemedy**  
Replace 88.9.9 with 88.9.10.

**Proposed Response**  
**Response Status W**  
PROPOSED ACCEPT IN PRINCIPLE.  
Replace "conformance test signal at TP3 (see 88.9.9) for BER = 10-12."  
Offending footnote:  
.dMeasured with conformance test signal at TP3 (see 88.9.9) for BER = 10-12.

**Comment Status D**  
**Response Status W**  
Maki, Jeffery  
Juniper Networks, Inc.

**TYPE: TR/technical required E/ 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: Clause, Subclause, page, line**
An SRS test is needed that system companies can use to qualify an optic. The test that component vendors do might be more complicated, but there should be a clear relation so that if a system company finds a part fails, the component vendor will too. Furthermore, the system company should not have to disassemble the part. The standard does not provide test plans, but the standard should lead to compatible test plans between system companies, their vendors, and even a system company's customers. The standard should not be written such that disparate interpretations are fostered leading to different quantitative results with no clear relation.

**Suggested Remedy**

See technical presentation to be submitted by a group of supporters reducing the number of tunable transmitters among other changes.

**PROPOSED ACCEPT IN PRINCIPLE.**

---

Corner frequency of 10 MHz for SJ add extra burden on the receiver and there is no reason to use such wide band as the power supply noise and clock phase noise typically are < 1 MHz.

**Suggested Remedy**

propose to use reduce the SJ corner frequency from 10 MHz to 6 MHz

**PROPOSED ACCEPT IN PRINCIPLE.**

---

In 88.9.10, the mix of references to Clauses 52 & 53 make the status of sinusoidal amplitude interference unclear.

- The measurement method references 53.9.12, 53.9.14 & 53.9.15
- note a) of Table 88-17 references 52.9.9.3

Clause 52 had both sinusoidal amplitude interference AND sinusoidal jitter

Can we assume NO sinusoidal amplitude interference because there is no reference to sinusoidal amplitude interference in 53.9.12/14/15?

Although 52.9.9 does refer to sinusoidal amplitude interference, that section is not mentioned in 88.9.10.

Although Table 88-17 does refer to 52.9.9.3, but it does so in the context of sinusoidal jitter, and not sinusoidal amplitude interference.

**Suggested Remedy**

In the 88.9.10 exception list, explicitly state either

1) sinusoidal amplitude interference (per 52.9.9) is required;
   or
2) sinusoidal amplitude interference (per 52.9.9) is not required

Inphi (with whom I am affiliated) will make a presentation at the July plenary in support of this comment.

**PROPOSED ACCEPT IN PRINCIPLE.**

---

This comment needs to be considered by the task force together with comment 224.
### IEEE P802.3ba D2.1 40Gb/s and 100Gb/s Ethernet comments

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

In 88.9.10, the references to 53.9.12-14 specify too much DCD DJ because LX4 defines DCD DJ in ps, not fractions of a UI.

- The serial rate at LX4 is 3.125Gb/s and minimum DCD DJ specified is 14 ps
- Using the same fractional UI at 25.78125Gb/s (UI=38.7878ps), the minimum DCD DJ should be 1.6969, rounded to 1.7 ps.

**Suggested Remedy:**
Add another exception (e) to 88.9.10, with DCD DJ of 1.7 ps.

**Inphi (with whom I am affiliated) will make a presentation at the July plenary in support of this comment.**

**Proposed Response**  **Response Status:** W

**PROPOSED ACCEPT IN PRINCIPLE.**
See response to comment 143

---

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

The CRU of 10 MHz add extra burden on the receiver and there is no reason to use such wide band CRU as the power supply noise and clock phase noise typically are not more than 1 MHz.

**Suggested Remedy:**
propose to use CRU BW=6 MHz

**Proposed Response**  **Response Status:** W

**PROPOSED ACCEPT IN PRINCIPLE.**
This comment needs to be considered by the task force together with comment 225

---

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

This numerical value 18.75 does not appear to be appropriate for this standard, and does not align with any of the likely numerical values.

- $0.75 \times (10 \times 10.3125)/4 = 0.75 \times 25.78125 = 19.34$
- $0.75 \times (10 \times 11.0957)/4 = 20.80$

Since there is no relation to 10G, there is no need to use $0.75 \times (10 \times 10)/4 = 0.75 \times 25 = 18.75$

**Suggested Remedy:**
For internal consistency of this standard, we should use $0.75 \times (10 \times 11.0957)/4 = 20.80$. At a minimum, we should use $0.75 \times (10 \times 10.3125)/4 = 0.75 \times 25.78125 = 19.34$.

**Proposed Response**  **Response Status:** W

**PROPOSED ACCEPT IN PRINCIPLE.**
Change "The filter nominal reference frequency fr is 18.75 GHz" to "The filter nominal reference frequency fr is 19.34 GHz"

---

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

Editors stopped allowing listing of projects in amendments, the listing is only included in a revision.

**Suggested Remedy:**
Check for consistency of front matter with latest 802.3 front matter template, where it should refer to the listing in the base revision document.

**Proposed Response**  **Response Status:** W

**PROPOSED ACCEPT IN PRINCIPLE.**
This text follows the current version of front matter template.

Check for any latest revision to front matter template and update 802.3ba front matter if appropriate.
<table>
<thead>
<tr>
<th>Cl/99</th>
<th>SC 99</th>
<th>P 1</th>
<th>L 45</th>
<th># 386</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grow, Robert</td>
<td>Intel</td>
<td>Comment Type: E</td>
<td>Comment Status: D</td>
<td>Inconsistent usage on publication year for IEEE Std 802.3ba-200X. Earlier was 20XX and planned date for submission of project would require XX.</td>
</tr>
<tr>
<td>SuggestedRemedy</td>
<td></td>
<td>Change to -20XX for convenience of future search. Search document for &quot;-20XX&quot; (case insensitive) and replace with &quot;-20XX&quot;.</td>
<td></td>
<td></td>
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<tr>
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<td>Response Status: W</td>
<td>PROPOSED ACCEPT IN PRINCIPLE.</td>
<td></td>
<td></td>
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<tr>
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<td></td>
<td>The suggested change may not be applicable to other amendments. Search for 802.3ba-200X and replace with 802.3ba-20XX.</td>
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<th>P 2</th>
<th>L 3</th>
<th># 387</th>
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<td>Law, David</td>
<td>3Com</td>
<td>Comment Type: E</td>
<td>Comment Status: D</td>
<td>According to the 2009 style guide the email address the ipr email address should be included in the frontmatter notice.</td>
</tr>
<tr>
<td>SuggestedRemedy</td>
<td></td>
<td>Change <code>. IEEE Standards Activities Department.' to read </code>IEEE Standards Activities Department (<a href="mailto:stds.ipr@ieee.org">stds.ipr@ieee.org</a>).'.</td>
<td></td>
<td></td>
</tr>
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<td>Make the suggested change to 802.3ba front matter and forward this comment for changing the front matter template.</td>
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<th>L 46</th>
<th># 389</th>
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</thead>
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<td>Comment Status: D</td>
<td>I belive that the following text should appear at the bottom of page 2 of the frontmatter.</td>
</tr>
<tr>
<td>SuggestedRemedy</td>
<td></td>
<td>The Institute of Electrical and Electronics Engineers, Inc. 3 Park Avenue, New York, NY 10016-5997, USA</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Copyright © 2009 by the Institute of Electrical and Electronics Engineers, Inc. All rights reserved. Published xx Month 200x. Printed in the United States of America.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>IEEE is a registered trademark in the U.S. Patent &amp; Trademark Office, owned by the Institute of Electrical and Electronics Engineers, Incorporated.</td>
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<tr>
<td></td>
<td></td>
<td>Check the latest front matter template and update if appropriate.</td>
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<td></td>
</tr>
</tbody>
</table>
The keywords do not include Ethernet anywhere, only the abbreviation GbE.

Suggested Remedy
So that a keyword search for Ethernet finds IEEE P802.3ba please change ‘40GbE’ to read ‘40 Gb/s Ethernet’ and ‘100GbE’ to read ‘100 Gb/s Ethernet’.

Proposed Response

PROPOSED ACCEPT IN PRINCIPLE.

Change "40GbE" to "40 Gb/s Ethernet"
Change "100GbE" to "100 Gb/s Ethernet"

The approval of IEEE P802.3at is contingent on the approval of IEEE P802.3bc so IEEE P802.3bc should appear in the list before IEEE P802.3at. It is also likely that IEEE P802.3-1998/Cor1 (IEEE 802.3bb) will also be published before IEEE P802.3ba.

Suggested Remedy
Add the following two projects to the list:

IEEE Std 802.3bc(TM)-200X
This amendment includes changes to IEEE Std 802.3-2008 and adds Clause 79. This amendment transfers the IEEE 802.3 Organizationally Specific TLVs that were originally specified in IEEE Std 802.1AB Station and Media Access Control Connectivity Discovery to IEEE Std 802.3.

IEEE Std 802.3-2008/Cor 1(TM)-200X
This corrigendum corrects the PAUSE reaction delay value specified for some PHY types.

Proposed Response
PROPOSED ACCEPT.