<table>
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<th>#</th>
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<th>Comment Status</th>
<th>Proposed Response</th>
<th>Response Status</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>E</td>
<td>X</td>
<td></td>
<td>O</td>
</tr>
<tr>
<td></td>
<td>Spelling: Should be change 'de-skew' to 'deskew' for consistency.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>T</td>
<td>X</td>
<td></td>
<td>O</td>
</tr>
</tbody>
</table>
|    | At Data Block Formats and Control Block Formats:  
The slash('/') is used to separate and represent two 4 bytes transfer in 10GBase-R, but in 40G/100GBase-R there is no need slash('/') between 8 bytes. |               |                  |                 |
| 3  | T            | X              |                   | O               |
|    | Should be change 'rx_raw<63>' to 'rx_raw<71>'. |               |                  |                 |
| 4  | T            | X              |                   | O               |
|    | Should be change 'per 31.25' to 'per 31.25 us'. |               |                  |                 |
| 5  | T            | X              |                   | O               |
|    | Should be change 'am_cnt = 2 *' to 'am_cnt = 4 *'. |               |                  |                 |
| 6  | T            | X              |                   | O               |
|    | Should be change '2_GOOD' to '4_GOOD'. |               |                  |                 |
For BlockTypeField 0xb4, 0xcc, 0xd2 & 0xe1, missing one more "single bit" field (marked by thin rectangle).

SuggestedRemedy
Add "thin rectangle" for BlockTypeField 0xb4, 0xcc, 0xd2 & 0xe1.

---

The state diagram in figure 152-12 shows that after am_lock is achieved, if there are 4 !am_valid conditions in a fixed window of 4 alignment marker periods, then am_lock is set to false. Because the window is fixed in time, it is possible that up to 6 !am_valid conditions may occur and the state machine will remain in lock (i.e. 3 !am_valid conditions in one window followed immediately by 3 more !am_valid conditions in the next window).

SuggestedRemedy
Suggested remedy is to make the window "sliding". That is, if there are four consecutive !am_valid conditions over any four align marker periods, then the am_lock is set to false.

---

The definition of 40GBASE-SR4 is "IEEE 802.3 Physical Layer specification for 40 Gb/s using 40GBASE-R encoding over four lanes of, short reach, multi mode fiber." This implies that the fibre alone determines the reach.

SuggestedRemedy
Re-word as: "40GBASE-SR4: IEEE 802.3 Physical Layer specification for 40 Gb/s using 40GBASE-R encoding over four lanes of multi mode fiber with short reach. (See IEEE 802.3, Clause 86.)"

Similarly re-word 100GBASE-SR10 definition to:
"100GBASE-SR10: IEEE 802.3 Physical Layer specification for 100 Gb/s using 100GBASE-R encoding over ten lanes of multi mode fiber with short reach. (See IEEE 802.3, Clause 86.)"

---

The definition of 100GBASE-ER4 "IEEE 802.3 Physical Layer specification for 100 Gb/s using 100GBASE-R encoding over four WDM lanes, extended long reach, single mode fiber." This implies that the fibre alone determines the reach.

SuggestedRemedy
Re-word as: "100GBASE-ER4: IEEE 802.3 Physical Layer specification for 100 Gb/s using 100GBASE-R encoding over four WDM lanes on single mode fiber with extended reach. (See IEEE 802.3, Clause 88.)"

Similarly re-word 100GBASE-LR4 definition to:
"100GBASE-LR4: IEEE 802.3 Physical Layer specification for 100 Gb/s using 100GBASE-R encoding over four WDM lanes on single mode fiber with long reach. (See IEEE 802.3, Clause 88.)"
Comment ID: 11

Cl 01 SC 1.4 P 23 L 1 # 11
Anslow, Peter Nortel Networks

Comment Type: T
Comment Status: X

The definition of 40GBASE-LR4 is missing

SuggestedRemedy

Add the definition as:
"40GBASE-LR4: IEEE 802.3 Physical Layer specification for 40 Gb/s using 40GBASE-R encoding over four WDM lanes on single mode fiber with long reach. (See IEEE 802.3, Clause 87.)"

Proposed Response
Response Status: O

Comment ID: 12

Cl 01 SC 1.4 P 23 L 44 # 12
Anslow, Peter Nortel Networks

Comment Type: E
Comment Status: X

The definition of virtual lanes is awkwardly worded:
"Virtual Lane: In 40GBASE-R and 100GBASE-R, the PCS distributes encoded data to multiple logical lanes, these logical lanes are called virtual lanes. They are called virtual lanes since one or more of PCS lanes can be multiplexed and carried on a physical lane together at the PMA interface."

SuggestedRemedy

Re-word as:
"Virtual Lane: In 40GBASE-R and 100GBASE-R, the PCS distributes encoded data to multiple logical lanes, these logical lanes are called virtual lanes since one or more of the PCS lanes can be multiplexed and carried on a physical lane together at the PMA interface."

Proposed Response
Response Status: O

Comment ID: 13

Cl 01 SC 1.4 P 23 L 50 # 13
Anslow, Peter Nortel Networks

Comment Type: E
Comment Status: X

The modified definition for "1.4.311 RMS spectral width" is shown in italic font. The font should match the base document

SuggestedRemedy

Change the font of the modified definition for RMS spectral width to match the base document

Proposed Response
Response Status: O

Comment ID: 14

Cl 01 SC 1.5 P 24 L 5 # 14
Anslow, Peter Nortel Networks

Comment Type: T
Comment Status: X

The abbreviation CAUI is expanded as "100Gb/s Attachment Unit Interface" but the other abbreviations use "Gigabit" rather than "Gb/s"

SuggestedRemedy

Change to "100 Gigabit Attachment Unit Interface"

Proposed Response
Response Status: O

Comment ID: 15

Cl 01 SC 1.5 P 24 L 11 # 15
Anslow, Peter Nortel Networks

Comment Type: T
Comment Status: X

The abbreviation OPU3 is expanded as "Optical Payload Unit 3" but OPU is defined in ITU-T G.709 as "Optical channel Payload Unit"

SuggestedRemedy

Change to "Optical channel Payload Unit 3"

Proposed Response
Response Status: O

Comment ID: 16

Cl 04 SC 4.4.2 P 25 L 46 # 16
Anslow, Peter Nortel Networks

Comment Type: T
Comment Status: X

Underneath the new note 7 there is a box containing "WARNING Any deviation from the above specified values may affect proper operation of the network.” This warning box is already present in the base standard beneath the notes to Table 4-2. Is this warning to be added again part way through the notes? If so, this has the effect of effectively removing the warning from all of the notes except new note 7 and the last note.

SuggestedRemedy

Remove the warning box from below the new note 7

Proposed Response
Response Status: O
Comment Type: T  Comment Status: X
Table 45-3 Note a says "The name "Backplane/Copper/TBD" is used to denote PHYs that use the PMD described in Clause 72, including PHYS designated as BASE-KR and BASE-CR" but Clause 72 only covers 10GBase-KR
Suggested Remedy
change "The name "Backplane/Copper/TBD" is used to denote PHYs that use the PMDs described in Clause 72, 84 or 85, including PHYs designated as BASE-KR and BASE-CR"
Proposed Response

Comment Type: E  Comment Status: X
The editing instruction says "Insert 45.2.1.4.7 and 45.2.1.4.8 as follows:" but the inserted clauses are 45.2.1.4.8 and 45.2.1.4.9 (leaving room for 802.3av to insert 45.2.1.4.7)
Suggested Remedy
change editing instruction to "Insert 45.2.1.4.8 and 45.2.1.4.9 as follows:"
Proposed Response

Comment Type: T  Comment Status: X
The first sentence is modified to be "The PMA/PMD type of the PMA/PMD shall be selected using bits 4 through 0." However Table 45-7 uses bits 5 through 0
Suggested Remedy
Change "using bits 4 through 0." to "using bits 5 through 0."
Proposed Response
Anslow, Peter Nortel Networks

Comment Type T  Comment Status X
This refers to Table 45-96 but the new table is 45-96a

SuggestedRemedy
Change reference to Table 45-96a

Proposed Response  Response Status O

---

Anslow, Peter Nortel Networks

Comment Type T  Comment Status X
This refers to Table 45-97 but the new table is 45-97a

SuggestedRemedy
Change reference to Table 45-97a

Proposed Response  Response Status O

---

Anslow, Peter Nortel Networks

Comment Type T  Comment Status X
Titles of 45.2.3.18a.4 through 45.2.3.18a.8 refer to the wrong bits and in 45.2.3.18a.4 “bit 3.51.9” should be “bit 3.51.8”

SuggestedRemedy
change titles of 45.2.3.18a.4 through 45.2.3.18a.8:
from “Lane 16 lock (3.51.9)” to “Lane 16 lock (3.51.8)”
from “Lane 15 lock (3.51.3)” to “Lane 15 lock (3.51.1)”
from “Lane 14 lock (3.51.2)” to “Lane 14 lock (3.51.6)”
from “Lane 13 lock (3.51.1)” to “Lane 13 lock (3.51.5)”
from “Lane 12 lock (3.51.0)” to “Lane 12 lock (3.51.4)”
and in 45.2.3.18a.4 change “bit 3.51.9” to “bit 3.51.8”

Proposed Response  Response Status O

---

Anslow, Peter Nortel Networks

Comment Type T  Comment Status X
This refers to Table 45-98 but the new table is 45-99a

SuggestedRemedy
Change reference to Table 45-99a

Proposed Response  Response Status O
Cl 45 SC 45.2.3.20a.1 P 62 L 50 # 29
Anslow, Peter Nortel Networks

Comment Type T  Comment Status X
In 45.2.3.20a.1 through 45.2.3.20a.12 the text refers to "bit 3.51.x" which should be "bit 3.53.x"

In 45.2.3.20a.4 "bit 3.51.9" should be "bit 3.53.8"

Suggested Remedy
Change "bit 3.51." to "bit 3.53." in 23 places and in 45.2.3.20a.4 change "bit 3.51.9" to "bit 3.53.8"

Proposed Response Response Status O

Cl 45 SC 45.2.3.20a P 63 L 5 # 30
Anslow, Peter Nortel Networks

Comment Type T  Comment Status X
In Table 45-99a in the first column 3.50.x should be 3.53.x

Suggested Remedy
Change "3.50." to "3.53." in 13 places

Proposed Response Response Status O

Cl 45 SC 45.2.3.20a.4 P 64 L 1 # 31
Anslow, Peter Nortel Networks

Comment Type T  Comment Status X
Titles of 45.2.3.20a.4 through 45.2.3.20a.8 refer to the wrong bits

Suggested Remedy
change titles of 45.2.3.20a.4 through 45.2.3.20a.8:
from "Lane 16 aligned (3.53.9)" to "Lane 16 aligned (3.53.8)"
from "Lane 15 aligned (3.53.3)" to "Lane 15 aligned (3.53.7)"
from "Lane 14 aligned (3.53.2)" to "Lane 14 aligned (3.53.6)"
from "Lane 13 aligned (3.53.1)" to "Lane 13 aligned (3.53.5)"
from "Lane 12 aligned (3.53.0)" to "Lane 12 aligned (3.53.4)"

Proposed Response Response Status O

Cl 45 SC 45.2.3.20b.12 P 66 L 17 # 52
Anslow, Peter Nortel Networks

Comment Type E  Comment Status X
In Table 45-142 bit 7.48.7 has been Reserved. However the whole row should be shown in underline font as it is new.

Suggested Remedy
Show whole row for bit 7.48.7 in underline font

Proposed Response Response Status O
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<th>Type</th>
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<th>Response Status</th>
<th>Anslow, Peter</th>
<th>Cl SC</th>
<th>P L</th>
<th>#</th>
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<td>O</td>
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<td>86</td>
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<td>E</td>
<td>X</td>
<td>O</td>
<td>80</td>
<td>86</td>
<td>53</td>
</tr>
<tr>
<td>item e) currently reads &quot;The PMD Service Interface, which, when physically implemented at an observable interconnection port, uses a 4 or 10 lane data path as specified in Clause 86.&quot; To match the other items the name PPI should be included.</td>
<td></td>
<td></td>
<td></td>
<td>Nortel Networks</td>
<td>80</td>
<td>86</td>
<td>80.1.3</td>
</tr>
<tr>
<td>Suggested Remedy</td>
<td>change &quot;when physically implemented at an observable interconnection port&quot; to &quot;when physically implemented as PPI (Parallel Physical Interface) at an observable interconnection port&quot;</td>
<td></td>
<td></td>
<td></td>
<td>35</td>
<td></td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>E</td>
<td>X</td>
<td>O</td>
<td>Nortel Networks</td>
<td>80</td>
<td>87</td>
<td>18</td>
</tr>
<tr>
<td>This says &quot;The letter C in the port type (e.g. 40GBASE-CR4 or 100GBASE-CR10) represents a physical medium of shielded balanced copper cabling assembly of at least 10 m in length.&quot;. But the physical medium is up to 10 m in length. It is the PMD that is capable of at least 10 m.</td>
<td></td>
<td></td>
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<td>80</td>
<td>87</td>
<td>80.1.4</td>
</tr>
<tr>
<td>Suggested Remedy</td>
<td>Either change &quot;at least&quot; to &quot;up to&quot; in 5 places in this paragraph, or change &quot;represents a physical&quot; to &quot;represents a port capable of operation over a physical&quot; in 5 places</td>
<td></td>
<td></td>
<td></td>
<td>36</td>
<td></td>
<td></td>
</tr>
<tr>
<td>37</td>
<td>E</td>
<td>X</td>
<td>O</td>
<td>Nortel Networks</td>
<td>80</td>
<td>87</td>
<td>5</td>
</tr>
<tr>
<td>This contains &quot;implementations and the Table 80–1 specifies&quot; which reads awkwardly.</td>
<td></td>
<td></td>
<td></td>
<td>Nortel Networks</td>
<td>80</td>
<td>87</td>
<td>80.2.3</td>
</tr>
<tr>
<td>Suggested Remedy</td>
<td>&quot;implementations and the Table 80–1 specifies&quot; to &quot;implementations. Table 80–1 specifies&quot;</td>
<td></td>
<td></td>
<td></td>
<td>37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>38</td>
<td>E</td>
<td>X</td>
<td>O</td>
<td>Nortel Networks</td>
<td>80</td>
<td>88</td>
<td>37</td>
</tr>
<tr>
<td>This paragraph mentions all of the PHY types except 40GBASE-LR4. Also, the english could be improved.</td>
<td></td>
<td></td>
<td></td>
<td>Nortel Networks</td>
<td>80</td>
<td>88</td>
<td>80.2.3</td>
</tr>
<tr>
<td>Suggested Remedy</td>
<td>Add 40GBASE-LR4 to the list of 40G PHY types, change &quot;The terms 40GBASE-R and 100GBASE-R refers&quot; to &quot;The terms 40GBASE-R and 100GBASE-R refer&quot; and change &quot;based upon 64B/66B data coding method&quot; to &quot;based upon the 64B/66B data coding method&quot;</td>
<td></td>
<td></td>
<td></td>
<td>38</td>
<td></td>
<td></td>
</tr>
<tr>
<td>39</td>
<td>E</td>
<td>X</td>
<td>O</td>
<td>Nortel Networks</td>
<td>80</td>
<td>89</td>
<td>46</td>
</tr>
<tr>
<td>In Table 80-1 the reference for 40GBASE-LR4 is only to clause 87 rather than 87.2.1</td>
<td></td>
<td></td>
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<td>80</td>
<td>89</td>
<td>80.3</td>
</tr>
<tr>
<td>Suggested Remedy</td>
<td>Change &quot;See 87.&quot; to &quot;See 87.2.1.&quot;</td>
<td></td>
<td></td>
<td></td>
<td>39</td>
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</tr>
<tr>
<td>40</td>
<td>E</td>
<td>X</td>
<td>O</td>
<td>Nortel Networks</td>
<td>82</td>
<td>115</td>
<td>22</td>
</tr>
<tr>
<td>The title of 82.1.3.3 is &quot;Physical Medium Attachment (PMD) sublayer&quot;. This should be &quot;Physical Medium Dependent (PMD) sublayer&quot;</td>
<td></td>
<td></td>
<td></td>
<td>Nortel Networks</td>
<td>82</td>
<td>115</td>
<td>82.1.3.3</td>
</tr>
<tr>
<td>Suggested Remedy</td>
<td>Change &quot;Physical Medium Attachment (PMD) sublayer&quot; to &quot;Physical Medium Dependent (PMD) sublayer&quot;</td>
<td></td>
<td></td>
<td></td>
<td>40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
In clause 81.3.4.3 there is a simple description of the Link Fault State Diagram. This says “The variable link_fault is set to indicate the value of a received Sequence ordered_set when four fault_sequences containing the same fault value have been received with each pair of fault sequences separated by less than 128 columns and no intervening fault_sequences of a different fault value.”

Simple descriptions for Figure 82–12—PCS lane lock state diagram, Figure 82–13—PCS alignment marker lock state diagram and Figure 82–15—BER monitor state diagram along the lines of that above would be very helpful.

**Suggested Remedy**

Add simple descriptions of the state diagrams for Figures 82-12, 82-13 and 82-15

**Proposed Response**

In Table 83-1 the 100GBASE-R receive list is almost the Tx list in reverse and swapped over, but not quite. Swapping 5:10 and 4:10 over would fix this

**Suggested Remedy**

Swap the 5:10 and 4:10 rows in the table

**Proposed Response**

This says “Upon completion of training, SIGNAL_DETECT shall be set to OK” but it is not clear that training must be completed on all lanes.

**Suggested Remedy**

Change “Upon completion of training, SIGNAL_DETECT shall be set to OK” to “Upon completion of training on all lanes, SIGNAL_DETECT shall be set to OK”

**Proposed Response**
When in loopback mode this says "When loopback mode is selected, transmission requests passed to the transmitter are shunted directly to the receiver, overriding any signal detected by the receiver on its attached link. Note, this bit does not affect the state of the transmitter." This text is not entirely clear whether the transmitter continues to send data.

This also applies to 85.7.8

**Suggested Remedy**

Change "are shunted directly" to "are sent directly"

Change "Note, this bit does not affect the state of the transmitter." to "Note that this bit does not affect the state of the transmitter which continues to send data (unless disabled)."

Also make these changes in 85.7.8

---

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

When in loopback mode this says "When loopback mode is selected, transmission requests passed to the transmitter are shunted directly to the receiver, overriding any signal detected by the receiver on its attached link. Note, this bit does not affect the state of the transmitter." This text is not entirely clear whether the transmitter continues to send data.

This also applies to 85.7.8

**Suggested Remedy**

Change "are shunted directly" to "are sent directly"

Change "Note, this bit does not affect the state of the transmitter." to "Note that this bit does not affect the state of the transmitter which continues to send data (unless disabled)."

Also make these changes in 85.7.8

---

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

Table 85-1 Note b contains two instances of "XLGMII" which should be "CGMII"

**Suggested Remedy**

Change "XLGMII" to "CGMII" in two places

---

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

Clause 85.7.7 is about lane-by-lane transmit disable function, but the text discusses "Global_PMD_transmit_disable function". This needs to be changed along the lines of clause 86.4.8

**Suggested Remedy**

Change the first two sentences from "The Global_PMD_transmit_disable function is optional. It allows the electrical transmitters in each lane to be selectively disabled." to "The PMD_transmit_disable_i function (where i represents the lane number in the range 0:3 or 0:9) is optional and allows the optical transmitter in each lane to be selectively disabled."

in item a) change "the Global_PMD_transmit_disable variable" to "a PMD_transmit_disable_i variable" and change "the transmitter such that" to "the transmitter associated with that variable such that"

in item b) change "may turn off the electrical transmitter." to "may set each PMD_transmit_disable_i to ONE, turning off the electrical transmitter in each lane."

in item c) change "Global_PMD_transmit_disable" to "PMD_transmit_disable_i"
Anslow, Peter
Nortel Networks

Comment Type: T
Comment Status: X
This says "with the exception of the transmitter specified in 85.8.3.3.," but 85.8.3.3 is the "Signaling speed range" and does not specify a transmitter.

SuggestedRemedy
Change this cross-reference to the intended subclause

Proposed Response
Response Status: O

---

Anslow, Peter
Nortel Networks

Comment Type: T
Comment Status: X
The nominal unit interval is given in Table 85-4 as "96.9697" but in clause 83A it is given as "96.96969697". Since the UI is the same for these two clauses, the number of significant figures quoted should be the same. Considering the 100 ppm tolerance, somewhere between these two seems appropriate.

SuggestedRemedy
Change all occurrences of "96.9697" and "96.96969697" to "96.969697" (four places in clause 85 and three places in clause 83A)

Proposed Response
Response Status: O

---

Anslow, Peter
Nortel Networks

Comment Type: E
Comment Status: X
This says "The purpose of each PHY sublayer is summarized in 82.1.4. 40 Gb/s and 100 Gb/s Ethernet is introduced in Clause 80." which would be better re-arranged

SuggestedRemedy
Change to "40 Gb/s and 100 Gb/s Ethernet is introduced in Clause 80 and the purpose of each PHY sublayer is summarized in 82.1.4."

Proposed Response
Response Status: O

---

Anslow, Peter
Nortel Networks

Comment Type: T
Comment Status: X
In table 86-7 the parameter "Total Jitter tolerance at TP1a" is at TP1 whereas the table title says "at TP1"

SuggestedRemedy
change table title from "PPI electrical transmit signal input specifications at TP1a" to "PPI electrical transmit signal input specifications at TP1 and TP1a"

Proposed Response
Response Status: O
Cl 86 SC 86.6.3 P 209 L 53 # 57
Anslow, Peter Nortel Networks

Comment Type T Comment Status X
This says "A signal with power in OMA and average power not within the ranges given cannot be compliant.". However either condition makes the signal non-compliant so it should be "or" not "and"

SuggestedRemedy
change "in OMA and average" to "in OMA or average"

Proposed Response Response Status O

Cl 84 SC 8 P 166 L 12 # 54
Sun Hyok, Chang Electronics and Teleco

Comment Type T Comment Status X
'40GBASE-KR' is wrong in the title of Subclause 84.8.

SuggestedRemedy
'40GBASE-KR' has to be replaced by '40GBASE-KR4'

Proposed Response Response Status O

Cl 87 SC 87.5 P 230 L 11 # 69
Chung, Hwan Seok ETRI

Comment Type T Comment Status X
It is wrong that '10GBASE-KR' is written at line 14 of Table 84-1.

SuggestedRemedy
'10GBASE-KR' has to be replaced by '40GBASE-KR4'

Proposed Response Response Status O
Cl 4A SC 4A P 267 L 21 # 70
Chung, Hwan Seok ETRI

Comment Type T Comment Status X
Rephrase sentence for consistency. Change "For 40 and 100 Gb/s operation," to "For 40 Gb/s and 100 Gb/s operation,"

SuggestedRemedy

Proposed Response Response Status O

Cl 80 SC 80.1.2 P 85 L 3138 # 71
Chung, Hwan Seok ETRI

Comment Type T Comment Status X
There are two types of description for MMF in D1.0 such as "multi mode fiber" and "multimode fiber". Across the entire document, "multimode fiber" was mostly used. So, to maintain consistency, it will be better to change "multi mode fiber" to "multimode fiber."
The change should be done in following lines.

Clause 1, page 23, line 21: multi mode fiber->multimode fiber
Clause 1, page 23, line 42: multi mode fiber->multimode fiber
Clause 80, page 85, line 31: multi mode fiber->multimode fiber
Clause 80, page 85, line 38: multi mode fiber->multimode fiber

SuggestedRemedy

Proposed Response Response Status O

Cl 99 SC 99 P 14 L 30 # 72
Chung, Hwan Seok ETRI

Comment Type T Comment Status X
In page 14, line 30, the title 40GBASE-KR should be changed to 40GBASE-KR4.

SuggestedRemedy

Proposed Response Response Status O
Cl 86 SC 1 P 201 L 23 # 76
Sun Hyok, Chang
Electronics and Teleco
Comment Type T
Comment Status X
'XLMII' is written at line 23 below Table 86-2.
SuggestedRemedy
'XLMII' has to be replaced by 'XLGMII'

Cl 87 SC 6 P 230 L 41 # 77
Sun Hyok, Chang
Electronics and Teleco
Comment Type T
Comment Status X
In Table 87-6, I think 'Minimum range' is confusing expression. Because '2m to 10 km' is not 'minimum'.
SuggestedRemedy
'Operating range' is easier to be understood. 'Minimum range' has to be replaced by 'Operating range'.

Cl 88 SC 6 P 250 L 41 # 78
Sun Hyok, Chang
Electronics and Teleco
Comment Type T
Comment Status X
In Table 88-6, I think 'Minimum range' is confusing expression. Because '2m to 10 km' is not 'minimum'.
SuggestedRemedy
'Operating range' is easier to be understood. 'Minimum range' has to be replaced by 'Operating range'.

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

Comment ID # 81 10/31/2008 1:24:14 PM
In line 26, 'operational range' is written. The term 'operational range' is used in line 23 and in the title of Table 88-10. So, 'operational range' in line 26 needs to be changed to 'operating range'.

**Suggested Remedy**

'operational range' has to be replaced by 'operating range'.

---

A comment has been submitted for Table 88-7 and 88-8 (10GBASE-LR4 transmit characteristics) to increase the max optical power by 0.5dB. The purpose of this comment for Table 88-12 is to align the 10GBASE-ER spec (40km) with the changes proposed to the 10GBASE-LR (10km) spec. This will make the 40km spec consistent with the intent of 802.3ba when it adopted it as baseline, specifically that it have interoperable overload characteristics with the 10km spec.

**Suggested Remedy**

The following three changes are proposed for table 88-12-100GBASE-ER4 receive characteristics:

- Receive power, per lane OMA (max): 4.0dBm => 4.5dBm
- Average receive power, per lane (max): 4dBm => 4.5dB
- Damage threshold: 5.0dBm => 5.5dBm

The SOA overload data presented in 802.3ba during this year fully supports increasing overload by 0.5dB.

---

"at least 100m"

**Suggested Remedy**

"at least 100m"

---

"at least 100m"

**Proposed Response**
Comment Type: ER  Comment Status: X
Bit 3.23.3 advertises the ability to test a PRBS9 pattern. However there is no corresponding "PRBS9 receive test-pattern enable" in Table 45-94.

Suggested Remedy:
I don't think there was any intention to add PRBS9 pattern verification. There is no mention of it in the PMA clause either. Remove Bit 3.23.3

Comment Type: ER  Comment Status: X
"The single lane PHY marks every 8th 64B/66B block" is not strictly true. It also always marks the last block in a frame (+7!) This is repeated on line 31 on the same page

Suggested Remedy:
Change to
"The single lane PHY marks every 8th and the last 64B/66B word in an FEC block" or similar. The four lane wording may need the same change.

Comment Type: T  Comment Status: X
There is confusion on this page as to where compensation for alignment marker removal is located.
* 82.2.13 says it is an RS sublayer function
* 82.2.15 says it is a Receive Process function
So which is it

Suggested Remedy:
Compensation for marker insertion is a PCS transmit function. So to be symmetrical compensation for removal should be in the receive process.

Suggested Remedy:
Set an accuracy limit for the error counter. eg indicate that the counter need only be bit accurate at error rates above say 1e-4, and for burst lengths of say less than 32bits

Suggested Remedy:
Use the 10GBASE-R pseudo-random pattern?
<table>
<thead>
<tr>
<th>Cl</th>
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<th>L</th>
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<th>Response Status</th>
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<tr>
<td>87</td>
<td>11s</td>
<td>239</td>
<td>14</td>
<td>T</td>
<td>X</td>
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<td></td>
<td>91</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Sun Hyok, Chang</td>
<td>Electronics and Teleco</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td>Proposed Response</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>SuggestedRemedy</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| In Table 87-13, 'DGD_max' is represented to describe the PMD (polarization mode dispersion) specification. But 'DGD_max' is not sufficient to give the PMD specification of the fiber link. Parameter of P(DGD_tot > DGD_max) is needed (from the Method 2 of IEC 61282-3). P(DGD_tot > DGD_max) is the probability that a system DGD value, DGD_tot, exceeds DGD_max.

**SuggestedRemedy**

Parameter of P(DGD_tot > DGD_max) per each lane is needed in Table 87-13.

| 88  | 12  | 262| 20 | T            | X              |                   |                 | 94           |
|     |     |    |    | Sun Hyok, Chang | Electronics and Teleco |                   |                 |              |
|     |     |    |    | Comment Type | T              |                   |                 |              |
|     |     |    |    | Comment Status | X              |                   |                 |              |
|     |     |    |    | Proposed Response |               |                   |                 |              |
| In line 21, it is written that 'DGD_max is the maximum differential group delay that the system must tolerate'. It is wrong. 'DGD_max' is defined in the Method 2 of IEC 61282-3. 'DGD_max' is defined with P(DGD_tot > DGD_max), which is the probability that a system DGD value, DGD_tot, exceeds DGD_max. 'DGD_max' and P(DGD_tot > DGD_max) give the DGD specification of the fiber link.

**SuggestedRemedy**

The sentence 'DGD_max is the maximum differential group delay that the system must tolerate' is needed to be replaced by 'DGD_max is defined in the Method 2 of IEC 61282-3'

| 83  | 0   | 144| 46 | E            | X              |                   |                 | 95           |
|     |     |    |    | Jongyoon, Shin | ETRI            |                   |                 |              |
|     |     |    |    | Comment Type | E              |                   |                 |              |
|     |     |    |    | Comment Status | X              |                   |                 |              |
|     |     |    |    | Proposed Response |               |                   |                 |              |
| Change all "sub-layer" to "sublayer" in clause 83 to keep consistency with other clauses.

**SuggestedRemedy**

| 83  | 83.1.3 | 144| 46 | E            | X              |                   |                 | 96           |
|     |     |    |    | Jongyoon, Shin | ETRI            |                   |                 |              |
|     |     |    |    | Comment Type | E              |                   |                 |              |
|     |     |    |    | Comment Status | X              |                   |                 |              |
| Change "optionally provides data loopback" to "optionally provide data loopback".

**SuggestedRemedy**

| 83  | 83 | 144| 46 | E            | X              |                   |                 | 97           |
|     |     |    |    | Jongyoon, Shin | ETRI            |                   |                 |              |
|     |     |    |    | Comment Type | E              |                   |                 |              |
| Change "optionally provides data loopback" to "optionally provide data loopback".

**SuggestedRemedy**

| 83  | 83.1.3 | 144| 46 | E            | X              |                   |                 | 98           |
|     |     |    |    | Jongyoon, Shin | ETRI            |                   |                 |              |
|     |     |    |    | Comment Type | E              |                   |                 |              |
| Change "optionally provides data loopback" to "optionally provide data loopback".

**SuggestedRemedy**

| 83  | 83.1.3 | 144| 46 | E            | X              |                   |                 | 99           |
|     |     |    |    | Jongyoon, Shin | ETRI            |                   |                 |              |
|     |     |    |    | Comment Type | E              |                   |                 |              |
| Change "optionally provides data loopback" to "optionally provide data loopback".

**SuggestedRemedy**

- **TYPE:** TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
- **COMMENT STATUS:** D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
- **SORT ORDER:** Comment ID
- **Page 16 of 123**
**Comment ID # 97**

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<th>Line</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
<th>Response Status</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>83 SC 83.1.4 P 146 L 6</td>
<td>E</td>
<td>In Table 83-1 change &quot;Logical output Lanes&quot; to &quot;Logical output lanes&quot;.</td>
<td></td>
<td>E</td>
<td>X</td>
<td></td>
<td></td>
<td>Jongyoon, Shin ETRI</td>
</tr>
<tr>
<td>83 SC 83.5 P 152 L 12</td>
<td>T</td>
<td>Need to clarify &quot;40GBASE-SR4 and 100GBASE-SR10 interfaces&quot; in the following text. &quot;Note that electrical and timing specifications of the PMD service interface are defined only for 40GBASE-SR4 and 100GBASE-SR10 interfaces.&quot;</td>
<td></td>
<td>T</td>
<td>X</td>
<td>Change &quot;Note that electrical and timing specifications of the PMD service interface are defined only for 40GBASE-SR4 and 100GBASE-SR10 interfaces.&quot; to &quot;Note that electrical and timing specifications of the PMD service interface are defined only for 40GBASE-SR4 and 100GBASE-SR10 PMDs.&quot;</td>
<td></td>
<td>Jongyoon, Shin ETRI</td>
</tr>
<tr>
<td>82 SC Figure 13 P 137 L 27</td>
<td>TR</td>
<td>It may require as many as 100,000 test_am instances before the AM Lock FSM will reach $2_{GOOD}$ (assuming that the location of the Alignment Marker is in the last of the 16384 possible locations checked by the PCS AM Lock State Machine). Is this a reasonable worst-case start-up delay?</td>
<td></td>
<td>TR</td>
<td>X</td>
<td>Even though the AM_SLIP function is listed as implementation specific, indicate to the reader that the delay caused by the PCS AM Lock State Machine may take up to 100,000 blocks before reaching am_lock.</td>
<td></td>
<td>Ebbers, Jonathan IBM</td>
</tr>
</tbody>
</table>

**Comment ID # 98**

<table>
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<th>Suggested Remedy</th>
<th>Response Status</th>
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</tr>
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<tbody>
<tr>
<td>82 SC 1.4 P 115 L 37</td>
<td>E</td>
<td>The 40GBASE-R PCS has a nominal rate at the PMA service interface of 10.3125 Mtransfers/s, which provides capacity for the MAC data rate of 40 Gb/s. The 100GBASE-R PCS has a nominal rate at the PMA service interface of 5.15625 Mtransfers/s, which provides capacity for the MAC data rate of 100 Gb/s.</td>
<td></td>
<td>E</td>
<td>X</td>
<td>Change &quot;The 40GBASE-R PCS has a nominal rate at the PMA service interface of 10.3125 Mtransfers/s, which provides capacity for the MAC data rate of 40 Gb/s. The 100GBASE-R PCS has a nominal rate at the PMA service interface of 5.15625 Mtransfers/s, which provides capacity for the MAC data rate of 100 Gb/s.&quot; to &quot;The 40GBASE-R PCS has a nominal rate at the PMA service interface of 10.3125 Gtransfers/s, which provides capacity for the MAC data rate of 40 Gb/s. The 100GBASE-R PCS has a nominal rate at the PMA service interface of 5.15625 Gtransfers/s, which provides capacity for the MAC data rate of 100 Gb/s.&quot;</td>
<td></td>
<td>Ebbers, Jonathan IBM</td>
</tr>
<tr>
<td>82 SC 2.4.11</td>
<td>E</td>
<td>&quot;sent&quot; and &quot;received&quot; are pretty ambiguous terms, especially since this is meant to apply to both the encoder (egress path) and decoder (ingress path). &quot;received&quot; is an especially poor choice of word given that it applies also to the Tx path.</td>
<td></td>
<td>E</td>
<td>X</td>
<td>For both the encoder and decoder, the /E/ is generated whenever an /E/ is detected. The /E/ allows the PCS to propagate detected errors.&quot; to &quot;For both the encoder and decoder, the /E/ is generated whenever an /E/ is detected. The /E/ is also generated when invalid blocks are detected. The /E/ allows the PCS to propagate detected errors.&quot;</td>
<td></td>
<td>Ebbers, Jonathan IBM</td>
</tr>
</tbody>
</table>

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

Page 17 of 123 10/31/2008 1:24:14 PM
Comment Type: E  
Comment Status: X

82.2.10 says that the scrambler starts off with a seed loaded from the MDIO registers.  This seems to contradict 82.2.6 which says that there is no initial value for the scrambler.  We suspect that there is no initial value for regular operation and a defined seed for test operation.  Should the specification be more specific on this point?

Suggested Remedy

Clarify the sentence in 82.2.6, "There is no requirement on the initial value for the scrambler." to "There is no requirement on the initial value for the scrambler for regular operation; test-patterns shall load an initial value from the MDIO registers."

Proposed Response  
Response Status: O

Comment Type: E  
Comment Status: X

"ALIGNMENT LOCK LANE DESKEW" should be "ALIGNMENT LOCK LANE DESKEW".

Suggested Remedy

Change "ALIGNMENT LOCK LANE DESKEW" to "ALIGNMENT LOCK LANE DESKEW".

Proposed Response  
Response Status: O

Comment Type: T  
Comment Status: X

For 100G, are we really going to run with TX_CLK and RX_CLK at 1.56GHz?  This seems like quite a frequency jump; I'm surprised no consideration was given to expanding the bus width from 4 bytes to 8 or 16.  We typically time the cores with 200 ps of margin, but 1.56G only gives us a 640ps cycle time.  I think even at 45nm this would be very tight to time.

Suggested Remedy

Clarify the frequency requirements or allow for a wider MII bus definition.

Proposed Response  
Response Status: O

Comment Type: T  
Comment Status: X

The title of this subclause is wrong. Also there is no need to mention the PMD and MDI here. All in all this is just adding confusion.

Suggested Remedy

Delete subclause 82.1.3.3.

Proposed Response  
Response Status: O
The sentence "The Reconciliation sublayer provides the same service interface to the PCS." does not make sense.

Suggested Remedy
Delete this sentence.

Proposed Response
Response Status O

Reword first two paragraphs to be similar to subclause 84.7.4 for clarity.

Suggested Remedy
Change:
"The Global PMD signal detect function shall report to the PMD service interface, using the message PMD_SIGNAL.indication (SIGNAL_DETECT) for 40GBASE-CR4 and PMD_SIGNAL.indication (SIGNAL_DETECT) for 100GBASE-CR10, which is signaled continuously. SIGNAL_DETECT in 40GBASE-CR4 and 100GBASE-CR10 indicates the successful completion of the start-up protocol on all four or ten lanes.

SIGNAL_DETECT, while normally intended to be an indicator of signal presence, is used by 40GBASE-CR4 and 100GBASE-CR10 to indicate the successful completion of the start-up protocol on each lane."

to
"The Global PMD signal detect function shall continuously report the message PMD_SIGNAL.indication (SIGNAL_DETECT) to the PMD service interface. SIGNAL_DETECT, while normally intended to be an indicator of signal presence, is used by 40GBASE-CR4 and 100GBASE-CR10 to indicate the successful completion of the start-up protocol on all lanes."

Proposed Response
Response Status O
<table>
<thead>
<tr>
<th>Comment ID #</th>
<th>Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
<th>Proposed Response</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>113</td>
<td>T</td>
<td>X</td>
<td>This text is redundant as it repeats what is described in 80.1.4 Nomenclature. Also it does not mention 40GBASE-LR4 and 'terms' should be 'term'.</td>
<td>Delete</td>
<td>O</td>
</tr>
<tr>
<td>114</td>
<td>T</td>
<td>X</td>
<td>The term 40GBASE-R refers to a specific family of Physical Layer implementations for 40 Gb/s such as 40GBASE-KR4, 40GBASE-CR4 and 40GBASE-SR4. The term 100GBASE-R refers to a specific family of Physical Layer implementations for 100 Gb/s such as 100GBASE-CR10, 100GBASE-SR10, 100GBASE-LR4 and 100GBASE-ER4. All 40GBASE-R and 100GBASE-R PHY devices share a common PCS specification defined in Clause 82.</td>
<td>So that the text reads: The term '40GBASE-R and 100GBASE-R' refers to a specific family of Physical Layer implementations based upon 64B/66B data coding method specified in Clause 82 and the PMA specification defined in Clause 83.</td>
<td>O</td>
</tr>
<tr>
<td>115</td>
<td>T</td>
<td>X</td>
<td>Most of the text and the state diagram in 81.3.4 has been copied verbatim from Clause 46.</td>
<td>Proposed Response</td>
<td>O</td>
</tr>
<tr>
<td>116</td>
<td>E</td>
<td>X</td>
<td>Punctuation delete comma before and</td>
<td>Change &quot;MAC, and&quot; to &quot;MAC and&quot;</td>
<td>O</td>
</tr>
<tr>
<td>117</td>
<td>E</td>
<td>X</td>
<td>grammar, independent needs to be an adverb.</td>
<td>Change to 'independently'.</td>
<td>O</td>
</tr>
<tr>
<td>Comment ID</td>
<td>Type</td>
<td>Comment Type</td>
<td>Page</td>
<td>Line</td>
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<tr>
<td>118</td>
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<td>E</td>
<td>85</td>
<td>45</td>
<td>Cl 80 SC 80.1.3</td>
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<td>E</td>
<td>113</td>
<td>12</td>
<td>Cl 82 SC 82.1.1</td>
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</table>

**Comment 118**
- **Comment:** The word "respectively" is redundant.
- **Proposed Response:** Delete "respectively".

**Comment 119**
- **Comment:** spelling of meter. Should this be 'metre'?  
  - **Proposed Response:** Consider changing to 'metre'.

**Comment 120**
- **Comment:** Punctuation, delete comma before and.
  - **Proposed Response:** Change '; and' to 'and'  
  - **Proposed Response:** on lines 12 and 13
<table>
<thead>
<tr>
<th>Comment Type</th>
<th>SuggestedRemedy</th>
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<tbody>
<tr>
<td>E</td>
<td>Listing of Editorial Team and Officers is incomplete.</td>
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</table>

**Proposed Response**

<table>
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<tbody>
<tr>
<td>123</td>
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</table>

**Comment Type**

| E | Approval of standards is listed as 15 September 200x. Schedule for standard approval at June standards board meeting. |

**SuggestedRemedy**

| Change "15 September 200x" to "xx June 2010" |

**Proposed Response**

<table>
<thead>
<tr>
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<tr>
<td>124</td>
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</table>

**Comment Type**

| E | Global - multiple instances where there are wrap-around issues with ToC. also multiple instances where there is no space between the clause # and the title of the clause or sub-clause. |

**SuggestedRemedy**

| Fix wraparound issues and add a space between the Clause # and title text. |

**Proposed Response**

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**Comment 126:**
The annex and the title of the annex are listed as separate entries in the ToC. Annex 30A - GDMO Specification for IEEE 802.3 Managed Object Classes
Annex 30B - GDMO and ASN.1 definitions for Management
Annex 69A - Interference Tolerance Testing
Annex 69B - Interconnect Characteristics
Annex 83A - 40 Gb/s Attachment Unit Interface (XLAUI) and 100 Gb/s Attachment Unit Interface (CAUI)

**Suggested Remedy:**
- In ToC list Annex # and title on same line

**Proposed Response:** 
- Response Status: O

**Comment 127:**
Clause 86.8.2 - Laser Safety does not show up in ToC. Not sure if this is related to the fact that in the bookmarks that 86.8.2 shows up as a subclause under 86.8.1.

**Suggested Remedy:**
- Correct ToC to show 86.8.2
correct bookmark in pdf file

**Proposed Response:** 
- Response Status: O

**Comment 128:**
Note states "Change Table 45-7 for 40Gb/s and 100 Gb/s PMA/PMD type selection," and then 45.2.1.8.1 is also noted to be changed for 40 Gb/s and 100 Gb/s PMA/PMD type selections. However, 45.2.1.1.3 states "When bits 5 through 2 are set to 000 the use of a 10G PMA/PMD is selected. More specific selection is performed using the PMA/PMD control 2 register (Register 1.7)"

**Suggested Remedy:**
- Modify 45.2.1.1.3 to state
  "When bits 5 through 2 are set to 000 the use of a >=10G PMA/PMD is selected. More specific selection is performed using the PMA/PMD control 2 register (Register 1.7)"

**Proposed Response:** 
- Response Status: O

**Comment 129:**
Bullet C is confusing in relation to what the actual functions in the PCS are, as the Tx PCS and Rx PCS seem to both be capable of adding / deleting idles.

**Suggested Remedy:**
- Replace bullet c with the following text -
  Compensation through insertion or deletion of idles for any rate difference caused by the insertion or deletion of alignment markers due to any rate difference between the MII and PMA

**Proposed Response:** 
- Response Status: O
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<td>D'Ambrosia, John</td>
<td>Force10 Networks</td>
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<td>Comment Type</td>
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<tr>
<td>Comment Status</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>subclauses not numbered properly - 80.11 should be 80.6</td>
<td></td>
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</tr>
<tr>
<td>Suggested Remedy</td>
<td>renumber 80.11 to 80.6</td>
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<tr>
<td>Proposed Response</td>
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<tr>
<td>choice of wording</td>
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</tr>
<tr>
<td>Suggested Remedy</td>
<td>reword</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>The purpose of the MII is to provide a simple and easy-to-implement logical interconnection between the Media Access Control (MAC) sublayer and the Physical Layer (PHY). The MII is not intended to be electrically instantiated, rather it can logically connect layers within a device.</td>
<td></td>
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<tr>
<td>The MII is an optional logical interface between the Media Access Control (MAC) sublayer and the Physical Layer (PHY).</td>
<td></td>
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<td>82</td>
<td>82.1.4</td>
<td>115</td>
<td>30</td>
<td>132</td>
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<td>D'Ambrosia, John</td>
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<tr>
<td>Comment Status</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>wording is confusing, as it implies that the two pcs's use two interfaces.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suggested Remedy</td>
<td>Reword</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>There are two interfaces employed by the 40GBASE-R and 100GBASE-R PCSs.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>There is one distinct interface employed for each rate of PCS.</td>
<td></td>
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<tr>
<td>Wording - A PMA connects to other sublayers.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Suggested Remedy</td>
<td>change</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The 40GBASE-R PMA can connect directly to one of the following Physical Layers: 40GBASE-R4, 40GBASE-LR4, 40GBASE-ER4, or 40GBASE-CR4. The 100GBASE-R PMA can connect directly to one of the following Physical Layers: 100GBASE-SR10, 100GBASE-LR4, 100GBASE-ER4, or 100GBASE-CR10.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The purpose of the 40GBASE-R PMA is to attach the 40GBASE-R PMD of choice to the 40GBASE-R PCS. The purpose of the 100GBASE-R PMA is to attach the 100GBASE-R PMD of choice to the 100GBASE-R PCS.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Proposed Response</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: Comment ID
D'Ambrosia, John  
Force10 Networks

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

**SuggestedRemedy**

Need a space between "isin"

change

Whether the PMA is in the Tx or Rx direction.

to

Whether the PMA is in the Tx or Rx direction.

---

D'Ambrosia, John  
Force10 Networks

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

**SuggestedRemedy**

change

The optional MDIO capability described in Clause 45 describes several variables that may provide control and status information for and about the PMA. Mapping of MDIO control variables to PMA control variables is shown in Table 83–3.

to

The optional MDIO capability described in Clause 45 describes several variables that provide control and status information for and about the PMA. Mapping of MDIO control variables to PMA control variables is shown in Table 83–3.

---

D'Ambrosia, John  
Force10 Networks

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

**SuggestedRemedy**

Recommend creating Annex 86A and moving PPI electrical specifications, as the PPI might eventually be used with PMDs.

Move all PPI electrical specifications into Annex 86A.
Cl  SC P L #

83A 83A.3.4 285 9 139
D'Ambrosia, John Force10 Networks
Comment Type E Comment Status X
Fig 83A-4 is inconsistent with similar diagrams in 802.3
Suggested Remedy
correct figure. Updated figure to be provided.
Proposed Response Response Status O

83A 83A.3.4.5 P L #
D'Ambrosia, John Force10 Networks
Comment Type E Comment Status X
Fig 83A-7 is inconsistent with similar diagrams in 802.3
Suggested Remedy
correct figure. Updated figure to be provided.
Proposed Response Response Status O

82 82.2.2 117 3 141
D'Ambrosia, John Force10 Networks
Comment Type ER Comment Status X
Wording of statement: "The PCS comprises the PCS Transmit and PCS Receive processes for 40GBASE-R and 100GBASE-R." implies that a single PCS is defined for both 40G and 100G rates.
Suggested Remedy
change sentence to:
The 40GBASE-R and 100GBASE-R PCS's comprise the PCS Transmit and PCS Receive processes for each rate of operation.
Proposed Response Response Status O

83 83.3 149 L 12 #
D'Ambrosia, John Force10 Networks
Comment Type ER Comment Status X
Re: reference to the PMA or PMA stages is inconsistent and can cause confusion.
Suggested Remedy
Reword -
Several PMA stages may be required to adapt between the number of VLs emerging from the PCS to the number of lanes required by a particular PMD. For example, a 4-lane interface for 100GBASE-R may involve a 20:10 PMA from the PCS, two 10:10 PMAs on either side of a CAUI for an extender, and a 10:4 PMA which finally interfaces with the PMD.

An example drawing would be useful.

Proposed Response Response Status O

83 83.6.6 154 L 39 #
D'Ambrosia, John Force10 Networks
Comment Type ER Comment Status X
Description of the multi-stage PMA concept is confusing
Suggested Remedy
At the PMA service interface, the uppermost PMA in a set of one or more stacked PMAs may provide a loopback function. The function involves looping back each input lane of the uppermost Tx PMA to an output lane of the uppermost Rx PMA.

The uppermost PMA stage in a set of one or more PMA stages may provide a loopback function. The function involves looping back each input lane of the uppermost Tx PMA stage to an output lane of the uppermost Rx PMA stage.

Presentation to be provided.

Proposed Response Response Status O
The specifications are summarized in Table 85–4 and detailed in 72.7.1.1 through 72.7.1.11 with the exception of the transmitter specified in 85.8.3.3. 85.8.3.3 is for signaling speed range, and is same for -KR.

**Suggested Remedy**
Correct reference from 85.8.3.3 to correct reference.

**Proposed Response**
Correct reference from 85.8.3.3 to correct reference.

---

Optional XLAUI / CAUI not shown in Table 80-1.

**Suggested Remedy**
show columns for 83A and XLAUI / CAUI. All 40GBASE-R PMDs should be optional for XLAUI and NA CAUI. All 100GBASE-R PMDs should be optional for CAUI and NA for XLAUI.

**Proposed Response**
Add columns for 83A and XLAUI / CAUI. All 40GBASE-R PMDs should be optional for XLAUI and NA CAUI. All 100GBASE-R PMDs should be optional for CAUI and NA for XLAUI.

---

Parallel Physical Interface (PPI). The PPI is provided as a physical instantiation of the PMD service interface for 40GBASE-SR4 and 100GBASE-SR10 PHYs. While conformance with implementation of this interface is not strictly necessary to ensure communication, it is recommended, since it allows maximum flexibility in intermixing PHYs and DTEs. The PPI is optional.

**Proposed Response**
Add "PPI" as a compatibility interface.
### Proposed Response 148

<table>
<thead>
<tr>
<th>Cl</th>
<th>SC</th>
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<td>Add Parallel Physical Interface (PPI) - The interface between the Physical Medium Attachment (PMA) sublayer and the Physical Medium Dependent (PMD) sublayer. (See IEEE 802.3, Clause 86)</td>
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### Proposed Response 149

<table>
<thead>
<tr>
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<td>Add 30.5.1.1.2 aMAUType</td>
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<td>40GBASE-KR4 - R PCS/PMA over an electrical backplane PMD as specified in Clause 84</td>
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<td></td>
<td></td>
<td>40GBASE-CR4 - R copper over 8 pair 100-Ohm balanced cable as specified in Clause 85</td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td>40GBASE-SR4 - R fiber over 8 OM3 multi-mode fibers as specified in Clause 86</td>
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<td></td>
<td></td>
<td>40GBASE-LR4 - R fiber over 4 wavelengths on single mode fiber as specified in Clause 87</td>
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<tr>
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<td></td>
<td></td>
<td>100GBASE-CR4 - R copper over 20 pair 100-Ohm balanced cable as specified in Clause 85</td>
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<tr>
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<td></td>
<td></td>
<td>100GBASE-SR10 - R fiber over 20 OM3 multi-mode fibers as specified in Clause 86</td>
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<td>100GBASE-LR4 - R fiber over 4 wavelengths on 10km single mode fiber as specified in Clause 88</td>
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### Proposed Response 150

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<td>40GBASE-R Clause 82 40 Gb/s 64B/66B</td>
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<td>100GBASE-R Clause 82 100 Gb/s 64B/66B</td>
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### Proposed Response 151

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<td>45</td>
<td>45.2.1.4.8</td>
<td>T</td>
<td>X</td>
<td>Note reads to &quot;Insert 45.2.1.4.7 and 45.2.1.4.8 as follows&quot; but the sections are entered in as 45.2.1.4.8 and 45.2.1.4.9</td>
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<td></td>
<td>The section #s are correct per Table 45-6, but the note is incorrect. Ignore note.</td>
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### Proposed Response 152

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<td>45</td>
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<td>X</td>
<td>Note reads to &quot;Insert 45.2.1.4.7 and 45.2.1.4.8 as follows&quot; but the sections are entered in as 45.2.1.4.8 and 45.2.1.4.9</td>
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<td></td>
<td></td>
<td></td>
<td>The section #s are correct per Table 45-6, but the note is incorrect. Ignore note.</td>
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</table>

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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:** Comment ID  
**Comment ID #** 152  
10/31/2008  1:24:15 PM
Implementers may not specify a different data width for 40GBASE-KR4.

**Suggested Remedy**
- Add the following:
  - Modify bullet f as follows:

**Comment Status**: X

**Response Status**: O

---

Figure 73-1 only reflects 1 Gb/s and 10 Gb/s, and does not reflect 40 Gb/s for 40GBASE-KR4 and 40GBASE-CR4 or 100 Gb/s for 100GBASE-CR10.

**Suggested Remedy**
- Add Fig 73-1 with the following modification: show location of auto-negotiation sublayer for 40 Gb/s and 100 Gb/s.

**Comment Status**: X

**Response Status**: O

---

Aspects of the PMA layering are incorrect.

**Suggested Remedy**
- XLAUI / CAUI should be marked as optional.
- PMA (4:4) and PMA (10:10) with optional notes are actually conditional based on implementation of optional interface.

**Comment Status**: X

**Response Status**: O
Per the baseline proposal, trowbridge_01_0708, PMA interfaces are abstract, logical, or physical.

Electrical and timing specifications for the XLAUI and CAUI interfaces based on 10Gb/s per lane signaling are covered in Annex 83A. The PMD service interfaces for 40GBASE-SR and 100GBASE-SR PMD are covered in 86.1.1. Other PMA interfaces are specified as logical interfaces, and may not be realized physically.

The interfaces for the inputs of the 40GBASE-R and 100GBASE-R PCS's are defined in an abstract manner and do not imply any particular implementation. The PMD service interfaces for 40GBASE-SR and 100GBASE-SR PMDs are defined in 86.1.1. Other PMD service interfaces are defined logically. For 40GBASE-R PMA's, an interface, known as XLAUI, connecting PMA stages has been defined in Annex 83A. For 100GBASE-R PMA's, an interface, known as CAUI, connecting PMA stages has been defined in Annex 83A.

Reference only to XLAUI is made, and then 40G and 100G PMDs list XLAUI as optional.

the equations driving Figure 86-4 use variables that are TBD, therefore the figure should be blank. furthermore, Note Figure 86-4 is inconsistent with similar figures in 802.3. Loss is a positive number.
<table>
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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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<tr>
<td>163</td>
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<td>no connectors were proposed in baseline for BASE-SR PMDs.</td>
<td></td>
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<tr>
<td>164</td>
<td>TR</td>
<td>X</td>
<td>The TF is waiting to hear back for confirmation from the ITU-T SG15 regarding the following statement -</td>
<td></td>
<td>O</td>
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<tr>
<td>165</td>
<td>TR</td>
<td>X</td>
<td>This section needs clarification, as it is ambiguous as to whether a single isolated lane is being tested or are all channels as an aggregate being tested.</td>
<td></td>
<td>O</td>
</tr>
<tr>
<td>167</td>
<td>TR</td>
<td>X</td>
<td>Informative interconnect characteristics are specified, &quot;Crosstalk requirements Informative interconnect characteristics for 40GBASE-KR4 are provided in Annex 69B.&quot; However, the crosstalk requirements for 10GBASE-KR were specified under the assumption that all crosstalk was uncorrelated. For a multilane approach crosstalk will come from correlated and uncorrelated sources.</td>
<td></td>
<td>O</td>
</tr>
</tbody>
</table>

**Proposed Response**

1. Replace references to IEC 61753-1-1 and IEC 61753-022-2 with TBD.
2. Add Editor's note stating that awaiting confirmation from ITU-T SG15 of the statement above from Liaison sent from July 08 Plenary meeting.
3. Provide a multi-lane xtalk specification that takes into account correlated & uncorrelated crosstalk sources. Presentation to be provided.
Comment Type: TR
Comment Status: X

A normative statement for the combination of sublayers is needed.

In order to form a complete PHY (Physical Layer device), a PMD is combined with the appropriate sublayers (see Table 85–1) and with the management functions, which are optionally accessible through the management interface defined in Clause 45, or equivalent.

Suggested Remedy:

change noted sentence to

In order to form a complete PHY, the desired PMD shall be combined with the appropriate sublayers (see Table 85–1) and with the management functions that are optionally accessible through the management interface defined in Clause 45, or equivalent.

Proposed Response: Response Status: O

---

Comment Type: E
Comment Status: X

...and Receive functions which convey... (comma is missing)

Suggested Remedy:

Change to: ...and Receive functions, which convey...

Proposed Response: Response Status: O

---

Comment Type: E
Comment Status: X

...of the Signal Detect function... (upper case letter for Signal Detect)

Suggested Remedy:

Change to: ...of the SIGNAL_DETECT function...

Proposed Response: Response Status: O
Cl 88 SC 88-7 P 251 L 24 # 176
Alping, Arne Ericsson AB

Comment Type E Comment Status X
Transmitter and dispersion penalty, each lane (max) (acronym is missing)

Suggested Remedy
Change to: Transmitter and Dispersion Penalty (TDP), each lane (max)

Proposed Response Response Status O

Cl 88 SC 8.10 P 250 L 43 # 177
Alping, Arne Ericsson AB

Comment Type E Comment Status X
...jitter and RIN... (missing comma)

Suggested Remedy
Change to: ...jitter, and RIN...

Proposed Response Response Status O

Cl 82 SC 2.8 P 125 L 49 # 178
Alping, Arne Ericsson AB

Comment Type ER Comment Status X
...has lots or transitions... (spelling error)

Suggested Remedy
Change to: ...has lots of transitions...

Proposed Response Response Status O

Cl 85 SC 8.5.4 P 259 L 4 # 179
Alping, Arne Ericsson AB

Comment Type ER Comment Status X
...filter to separate the lane... (spelling error)

Suggested Remedy
Change to: ...filter to separate the lane...

Proposed Response Response Status O
Proposed Response

COLE, Chris, Finisar

Comment Type: T  Comment Status: X

Table 88-7-100GBASE-LR4 transmit characteristics
Transmit eye mask definition \{X1, X2, X3, Y1, Y2, Y3\} TBD
The adopted 100GBASE-LR4 baseline (cole_01_0708) also had a footnote which stated "Tx eye mask spec to be specified as per eye mask methodology discussions." This specifically referred to using the results of the Statistical Eye discussions, which have now been formalized in the Statistical Eye Ad Hoc.
Since there is no final consensus recommendation from the Statistical Eye Ad Hoc, the specification TBD can not be completed.

Suggested Remedy
Replace TBD in Table 88-7 with eye mask coordinates as in Clause 52, Table 52.12. Add Transmitter Optical Waveform measurement procedure as in Clause 52 Section 52.9.7. Remove references to 10GBASE-L and 10GBASE-W, from second and third sentence, respectively.

Proposed Response: O

Comment Type: T  Comment Status: X

Table 88-11-100GBASE-ER4 transmit characteristics
Transmit eye mask definition \{X1, X2, X3, Y1, Y2, Y3\} TBD
The adopted 100GBASE-ER4 baseline (cole_02_0708) also had a footnote which stated "tx eye mask spec to be specified as per eye mask methodology discussions." This specifically referred to using the results of the Statistical Eye discussions, which have now been formalized in the Statistical Eye Ad Hoc.
Since there is no final consensus recommendation from the Statistical Eye Ad Hoc, the specification TBD can not be completed.

Suggested Remedy
Replace TBD in Table 88-11 with eye mask coordinates as in Clause 52, Table 52.12. Add Transmitter Optical Waveform measurement procedure as in Clause 52 Section 52.9.7. Remove references to 10GBASE-L and 10GBASE-W, from second and third sentence, respectively.

Proposed Response: O

Comment Type: ER  Comment Status: X

Another function of the alignment marker (lane re-order) is missing in the following sentence..."In order to support alignment and de-skew of individual lanes at the receive PCS, alignment markers are added periodically to each lane."
Also, the words "alignment" and "de-skew" are redundant.

Suggested Remedy
Add "lane reordering" and delete "alignment" in the sentence:
"In order to support de-skew and lane reordering of individual lanes at the receive PCS, alignment markers are added periodically to each lane."

Proposed Response: O
Comment Type: TR  Comment Status: X
Incorrect units (Mtransfers/s) in the following sentences.

"The 40GBASE-R PCS has a nominal rate at the PMA service interface of 10.3125 Mtransfers/s, which provides capacity for the MAC data rate of 40 Gb/s. The 100GBASE-R PCS has a nominal rate at the PMA service interface of 5.15625 Mtransfers/s, which provides capacity for the MAC data rate of 100 Gb/s."

Suggested Remedy
The units should be Btransfers or Gtransfers to convey billion transfers per second.

Proposed Response  Response Status: O

Comment Type: TR  Comment Status: X
In Figure 82–13—PCS alignment marker lock state diagram, the Test_AM loop is not skipping 16383 blocks before checking for the next valid AM.

Suggested Remedy
Insert a state and associated "16383 block" counter in the path between VALID_AM and TEST_AM to skip 16383 blocks before checking for the next valid AM.

Proposed Response  Response Status: O

Comment Type: TR  Comment Status: X
Incorrect interval in the following definition. Should be 16384.

"am_valid Boolean indication that is set true if received block rx_coded is a valid alignment marker. A valid alignment marker will match one of the encodings in Table 82–2 and it will be repeated every 16385 blocks. Note that we do not know which marker to expect on which lane."

Suggested Remedy
Replace 16385 with 16384.
"am_valid Boolean indication that is set true if received block rx_coded is a valid alignment marker. A valid alignment marker will match one of the encodings in Table 82–2 and it will be repeated every 16384 blocks. Note that we do not know which marker to expect on which lane."

Proposed Response  Response Status: O

Comment Type: TR  Comment Status: X
In Figure 82–2—Functional block diagram is missing the lane re-ordering function in the rx path.

Suggested Remedy
Insert a block called "Lane Reorder" after "Alignment Lock Lande Deskew" block.
The new block must be before the PCS Receive block.

Proposed Response  Response Status: O

Comment Type: TR  Comment Status: X
In Figure 82–13—PCS alignment marker lock state diagram, it appears the loop to fall out of lock will take either 4 or 7

Suggested Remedy
We will submit a new diagram to Mark G

Proposed Response  Response Status: O
<table>
<thead>
<tr>
<th>Comment ID</th>
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<th>Comment Status</th>
<th>Suggested Remedy</th>
<th>Proposed Response</th>
<th>Response Status</th>
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<td>192</td>
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<td>82</td>
<td></td>
<td>1</td>
<td><strong>SC</strong> P L</td>
<td><strong>T</strong></td>
<td>&quot;UCT&quot; appears in Figure 82–12—PCS lane lock state diagram but not defined in the document.</td>
<td>Define UCT and list it in the Abbreviations section.</td>
<td><strong>O</strong></td>
</tr>
<tr>
<td>193</td>
<td></td>
<td>82</td>
<td>82.2.4.3</td>
<td>119</td>
<td><strong>E</strong></td>
<td><strong>X</strong></td>
<td>Figure 82–3—PCS Transmit bit ordering has &quot;0 0 0&quot; between the columns. Should be &quot;...&quot;</td>
<td>Replace &quot;0 0 0&quot; with &quot;...&quot;</td>
<td><strong>O</strong></td>
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<td></td>
<td>82</td>
<td>82.2.4.3</td>
<td>120</td>
<td><strong>E</strong></td>
<td><strong>X</strong></td>
<td>Figure 82–4—PCS Receive bit ordering has &quot;0 0 0&quot; between the columns. Should be &quot;...&quot;</td>
<td>Replace &quot;0 0 0&quot; with &quot;...&quot;</td>
<td><strong>O</strong></td>
</tr>
</tbody>
</table>

**Comment ID # 196**

The XLAUI/CAUI specification is such that:
- The transmit test point is defined right at the transmitter output.
- The channel is normative
- The receiver test point is defined right at the receiver input.

The question is: Whose responsibility is it to ensure that the receiver input meets the specification defined in 83A.3.4.2 "Input signal definition"?

There may be a situation where each of the components meets the spec. requirements but the system does not work, i.e.
1. The transmitter meets the spec. requirements at its input.
2. The channel meets its specifications.
3. The receiver operates flawlessly with the input signal as defined in 83A.3.4.2.

But, since the resultant receiver input of transmitter+channel is not a requirement, the actual input signal will be different and the system will not work.

**Suggested Remedy**
- Leave the normative channel requirements.
- Change the transmit test point so that it is tested at the receiver input.
- If the transmitter meets the requirements, this will ensure a minimal input signal for the receiver.
- In addition, define the transmitter spec. requirements at that point so that they match 83A.3.4.2 "Input signal definition".

**Proposed Response**
- **O**
Cl  84  SC  84.1  P  159  L  14  #  197
Gu, Yuan  ZTE Corporation

Comment Type  E  Comment Status  X
In table 84-1,
  Change the 2nd column sub-title "10GBASE-KR" to "40GBASE-KR4"
SuggestedRemedy

Proposed Response  Response Status  O

Cl  85  SC  85.1  P  171  L  35  #  198
Gu, Yuan  ZTE Corporation

Comment Type  E  Comment Status  X
  Change "XLGMII" to "CGMII"
    also in line 36
    the same change
SuggestedRemedy

Proposed Response  Response Status  O

Cl  83A  SC  83A.4.3  P  291  L  28  #  199
SUZUKI, TOSHIHIRO  ANRITSU

Comment Type  T  Comment Status  X
  For XLAU/CAU should be tested under the worst condition.
  So jitter tolerance test should be executed with MLD pattern not PRBS.
SuggestedRemedy
  So jitter tolerance test should be executed with MLD pattern not PRBS.
Proposed Response  Response Status  O

Cl  82  SC  82.2.8  P  125  L  49  #  200
Marris, Arthur  Cadence

Comment Type  E  Comment Status  X
  change "lots or" to "many"
SuggestedRemedy
  as above
Proposed Response  Response Status  O

Cl  83  SC  83.2  P  148  L  44  #  201
Marris, Arthur  Cadence

Comment Type  E  Comment Status  X
  change isin to "is in".
SuggestedRemedy
  As above
Proposed Response  Response Status  O

Cl  82  SC  82.2.4.4  P  122  L  7  #  202
Marris, Arthur  Cadence

Comment Type  T  Comment Status  X
  Figure 82-5 improvements
SuggestedRemedy
  Remove the slash (/) in the middle of the block format description. For example change
  Delete redundant row with block type field 0x4b
  Width of C5, C6 and C7 is wrong for block type files 0xcc 0xd2 0xe1
Proposed Response  Response Status  O
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<td>P 126 L 32</td>
<td>T</td>
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<td>Use of boolean NOT operator. Is the use of the boolean operator ! appropriate for bit vector negation?</td>
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<td>SuggestedRemedy</td>
<td>Consider changing M0 = !M4 to M4 is the inverse of M0 etc.</td>
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<td>Proposed Response</td>
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<td>P 128 L 30</td>
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<td>Comment Type</td>
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<td>Inappropriate use of the word &quot;must&quot;.</td>
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<td>SuggestedRemedy</td>
<td>Change &quot;must reorder&quot; to &quot;reorders&quot;. Also similar problem on line 34 but in this case consider using shall.</td>
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<td>Proposed Response</td>
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<td>P 165 L 2</td>
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<td>SuggestedRemedy</td>
<td>as above</td>
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<td>P 239 L 15</td>
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<td>In Table 87-13, we propose DGD_max characteristics as &quot;10 ps&quot;</td>
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<td>SuggestedRemedy</td>
<td>The details of DGD_max for 40GBASE-LR4 will be presented in November plenary.</td>
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<td>In Table 87-17, we propose DGD_max characteristics for 100GBASE-LR4 and 100GBASE-ER4 as &quot;10 ps&quot; and &quot;7.6 ps&quot;, respectively.</td>
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<td>The details of DGD_max for 100GBASE-LR4 and 100GBASE-ER4 will be presented in November plenary.</td>
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Cl 83A SC 3.3 P 283 L 11 # 215
Mellitz, Richard Intel Corporation

Comment Type T Comment Status X
Jitter not consistent with electrical characteristics of 10GBASE-KR/ 40GBASE-KR

Suggested Remedy
Add:
- Max output jitter (peak-to-peak)
- Random jitter
- Deterministic jitter
- Duty Cycle Distortion

Proposed Response Response Status O

Cl 83A SC 3.3.4 P 286 L 25 # 216
Mellitz, Richard Intel Corporation

Comment Type T Comment Status X
Receiver compliance not consistent with electrical characteristics of 10GBASE-KR/ 40GBASE-KR

Suggested Remedy
Use section 69A (Interference tolerance testing)

Proposed Response Response Status O

Cl 83A SC 4 P 290 L 7 # 217
Mellitz, Richard Intel Corporation

Comment Type T Comment Status X

Suggested Remedy
Utilize style of IL, A, ILD, RL, and ICR in Annex 69b if parameters are applicable.

Proposed Response Response Status O

Cl 45 SC Table 45-96a P 57 L 1 # 219
Gustlin, Mark Cisco

Comment Type ER Comment Status X
Table title should include "register 1" since there are register 2,3 etc...

Suggested Remedy
Change it to:
"Table 45–96a—Multi-lane BASE-R PCS alignment status register 1 bit definitions"

Proposed Response Response Status O

Cl 45 SC 45.2.3.15 P 55 L 18 # 220
Gustlin, Mark Cisco

Comment Type ER Comment Status X
Currently it says:
"The test-pattern methodology is described in 49.2.8"

But this should also refer to clause 82 for 40/100G.

Suggested Remedy
Change to:
"The test-pattern methodology is described in 49.2.8 for 10 Gb/s and in 82.2.10 for 40/100GBASE-r"

Proposed Response Response Status O
Comment Type: ER
Comment Status: X
Table name is incorrect, should include 40/100.
Is:
Table 45–95—10GBASE-R PCS test-pattern error counter register bit definitions

Suggested Remedy
Change to:
Table 45–95—10/40/100GBASE-R PCS test-pattern error counter register bit definitions

Proposed Response

Comment Type: TR
Comment Status: X
Subclause 74.5 (which is not part of our D1.0) needs to be changed to enable it to hook up to our PCS and PMA sublayers.

Here are the current primitives for the FEC clause (based on the 16 bit wide parallel bus):
FEC (clause 74) primitives:
a) FEC_UNITDATA.request(tx_data-group<15:0>)
b) FEC_UNITDATA.indication(rx_data-group<15:0>)
c) FEC_SIGNAL.indication(SIGNAL_OK)

Right now this clause won't hook up to the PCS or PMA clause. Right now for the 40/100G PCS:
PMA_UNITDATA.requestx (x = 0-3 for 40GBASE-R) PMA_UNITDATA.indicatex (x = 0-3 for 40GBASE-R) PMA_SIGNAL.indication

We need to add the correct primitives to the FEC clause so it hooks up to the 40/100G PCS/PMA.

Suggested Remedy
This could just be:
40GBASE-R and 100GBASE-R run one instance of the FEC sublayer on each PCS lane.
To hook up to the PCS or PMA sublayers, the following primitives are used.
For 40GBASE-R the primitives are:
PMA_UNITDATA.requestx (x = 0-3) PMA_UNITDATA.indicatex (x = 0-3) PMA_SIGNAL.indication

For 100GBASE-R the primitives are:
PMA_UNITDATA.requestx (x = 0-19) PMA_UNITDATA.indicatex (x = 0-3) PMA_SIGNAL.indication

Proposed Response

Remove the following:

"81.3.5 PCS MDIO function mapping

[Editor's note (to be removed prior to publication) - Insert MDIO/MII variable mapping"

Clause 81 has no function mapping.

Suggested Remedy

Proposed Response Response Status O

In figure 82-2 there is a box around the encode and scramble blocks that is labeled PCS transmit. Enlarge this box to incorporate the block distribution and alignment insertion also. Also enlarge the box labeled PCS receive in include the BER monitor, alignment lock and lane block lock blocks.

Historically these boxes tried to include what was part of what state machine in clause 49, but it was not clear and confuses the issue.

Suggested Remedy

Proposed Response Response Status O

The PCS lane lock and high ber SMs won’t work properly with the FEC block due to how the FEC block marks errors.

Suggested Remedy

Make the changes to the state machine to implement what is in gustlin_01_1108. This will be presented at the meeting.

And Remove:

"[Editor's note (to be removed prior to publication) - FEC errored block marking will likely change some of the state machines since the FEC sublayer will need to mark many blocks bad to ensure that all 64B packets are dropped.]"
Comment Type: TR  Comment Status: X

So that 40G and 100G will have similar behavior when it comes to the PCS SM interactions with uncorrectable FEC blocks, change 40G marking behavior to be consistent with 100G (mark all blocks bad).

Suggested Remedy:

Change: The single lane PHY marks every 8th 64B/66B block, the four PCS-lane PHY marks every second 64B/66B block and the twenty PCS-lane PHY marks every 64B/66B block.

To: The single lane PHY marks every 8th 64B/66B block, the four and twenty PCS-lane PHYs marks every 64B/66B block.

Make the same change on line 31 of the same page also.

Proposed Response: Response Status: O

Comment Type: TR  Comment Status: X

Remove this subclause. And remove the editors note saying to add it in, and remove this section since this is being put in section 82.2.18.

Suggested Remedy:

Remove section 82.2.21.

Proposed Response: Response Status: O

Comment Type: TR  Comment Status: X

Officially adopt the test pattern strategy that is described here. Delete the editor's note.

Suggested Remedy:

Remove: "[Editor’s Note (to be removed prior to publication): There is no adopted baseline for test patterns - the following is a placeholder based on gustlin_03_0708.pdf]"

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

### Comment 232

**Comment ID**: #232
**Type**: TR/technical required
**Status**: X

**Comment Type**: TR
**Comment Status**: X
**Proposed Response**: O

**Comment**: Add in support for a PRBS9 pattern.

**Suggested Remedy**

- **Change**: "When transmit PRBS31 test pattern (see 49.2.8) is enabled (TBD - should a shorter pattern, e.g., PRBS9 (see 68.6.1) be included also?), the PMA generates a PRBS31 pattern on each of its output lanes."

- **To**: "When transmit PRBS31 test pattern (see 49.2.8) is enabled, the PMA generates a PRBS31 pattern on each of its output lanes. When transmit PRBS9 test pattern is enabled, the PMA generates a PRBS31 pattern on each of its output lanes."

- **Also add in anywhere else in the clause where it is appropriate the support for the PRBS9.**

**Proposed Response**

**Response Status**: O

---

### Comment 233

**Comment ID**: #233
**Type**: TR/technical required
**Status**: X

**Comment Type**: TR
**Comment Status**: X
**Proposed Response**: O

**Comment**: Change the format of the PCS management clause with one consistent with the latest table based format.

**Suggested Remedy**

- **Replace subclause 82.2.18 with the attached document (gustlin_82_2_18.pdf).**

**Proposed Response**

**Response Status**: O

---

### Comment 234

**Comment ID**: #234
**Type**: TR/technical required
**Status**: X

**Comment Type**: TR
**Comment Status**: X
**Proposed Response**: O

**Comment**: In clause 45, subclause 45.2.3.2.2, PCS receive link status(3.1.2), the supporting paragraph talks about 10GBASE-R using this bit as a latching low version of bit 3.32.12. This should be the same for 40/100GBASE-R.

**Suggested Remedy**

- **Add in appropriate text for 40/100GBASE-R.**

**Proposed Response**

**Response Status**: O

---

### Comment 235

**Comment ID**: #235
**Type**: TR/technical required
**Status**: X

**Comment Type**: TR
**Comment Status**: X
**Proposed Response**: O

**Comment**: In table 45-97a, the bits are numbered incorrectly, they should all be 3.51.x vs. 3.50 since the previous register used 3.50.x already.

**Suggested Remedy**

- **Change to 3.51.x in this table.**

**Proposed Response**

**Response Status**: O

---

### Comment 236

**Comment ID**: #236
**Type**: TR/technical required
**Status**: X

**Comment Type**: TR
**Comment Status**: X
**Proposed Response**: O

**Comment**: In table 45-99a, the bits are numbered incorrectly, they should all be 3.53.x vs. 3.50 since a previous register used 3.50.x already.

**Suggested Remedy**

- **Change the numbering to 3.53.x**

**Proposed Response**

**Response Status**: O

---

### Comment 237

**Comment ID**: #237
**Type**: TR/technical required
**Status**: X

**Comment Type**: TR
**Comment Status**: X
**Proposed Response**: O

**Comment**: In clause 81, subclause 81.3.4, the behavior does not allow unidirectional operation which is what is intended.

**Suggested Remedy**

- **Remove "[Editor's note (to be removed prior to publication) - The behavior described below does not allow unidirectional operation]"**

**Proposed Response**

**Response Status**: O
Currently the BER target is TBD. Change this to a BER of 10^-15. The PMD BER target is 10^-12, but if you have two CAUI/XLAUI interfaces in series with a PMD interface, all with a BER of 10^-12, you won't meet the overall goal of 10^-12. In addition this is a chip to chip interface which typically requires a higher BER target. 10^-15 seems to be a reasonable and achievable target.

Suggested Remedy

Change: "The receiver shall operate with a BER of better than TBD in the presence of a reference input signal as defined in 83A.3.4.2"

To:
"The receiver shall operate with a BER of better than 10^-15 in the presence of a reference input signal as defined in 83A.3.4.2"

Proposed Response  Response Status O

Today in clause 74, subclause 74.5.3 it describes the primitive FEC_SIGNAL_indication. This states if the FEC receive is in lock or not. This is fine for the legacy 16 bit parallel interface, but for 40/100GbE the FEC block could be across a XLAUI or CAUI interface from the PCS. It would be better if we defined the behavior for loss of FEC lock also for the case where we just have the XLAUI or CAUI if between the PCS and FEC block.

Suggested Remedy

Define the FEC loss of lock behavior as sending the raw unsynchronized bit stream to the PCS. Without FEC lock, and without the FEC block lock restoring the 66b blocks, the receive PCS will be down and out of lock which is what we want in this situation.

Proposed Response  Response Status O
**Comment Type:** T

**Comment Status:** X

**Comment:** Why is PRBS9 used for the short pattern? There are many more test equipment vendors and FPGA vendor cores for the ITU-T V.29 PRBS7 with 1+x^6+x^7 polynomial. It is shorter and quicker to see ISI evolving on a sampling scope.

**Suggested Remedy:**
Use the ITU-T V.29 PRBS polynomial

**Comment ID:** #243

**Comment:**

**Comment Type:** T

**Comment Status:** X

**Comment:** Why is there a term for 1/sqrt(f) in the insertion loss formula. The coefficient will most likely be 0.000 because it blows up at low frequencies. Read and microwave transmission line book and you see that the loss approaches a constant at low frequencies. Instead you need a constant term for the DC loss.

**Suggested Remedy:**
Insertion loss (d) <= TBD + TBD * sqrt(f) + TBD * f

**Comment ID:** #244

**Comment:**

**Comment Type:** T

**Comment Status:** X

**Comment:** In equation (85-6) the power of the NEXT loss is denoted NL(f). This is poor notation. Subscripts should not appear after function arguments.

**Suggested Remedy:**
More appropriate notation would be NL_i(f).

**Comment ID:** #245

**Comment:**

**Comment Type:** TR

**Comment Status:** X

**Comment:** Align control block type 4b with other 66B codes. The mapping of 40GbE into ODU3 will use a transcoding algorithm that is used for other purposes (e.g., mapping of FC1200 into ODU2e) and there is improved reuse if codes are aligned. This would also leave the door open to future use of the Ethernet PCS format, for example if FC in the future were to do a 40G or 100G spec. Since the sequence ordered set only has two values (LF and RF), three bytes are plenty- we don't need 7 bytes.

**Suggested Remedy:**
Block type 4b should explicitly include the "O" code as in Figure 49-7 (rather than assuming a sequence ordered set) and four control characters (always idles in this case) in the latter half of the 66B block. An alternate solution would be to have 802.3ba use control code 0x55 rather than 0x4b and simply send the ordered set which appears once on the MII twice on the PCS.

**Comment ID:** #246

**Comment:**

**Comment Type:** T

**Comment Status:** X

**Comment:** Should "96 bits" entry for 40 Gb/s and 100 Gb/s include reference to "NOTE 7" below the table? Note 7 explains that this could be as little as 8 bits in the Rx direction

**Suggested Remedy:**
Include reference to Note 7 in this table cell

**Comment ID:** #247
Comment Type: TR  Comment Status: X
Add reference to ITU-T Recommendation G.694.2 (CWDM grid) as this is now necessary for the 40GBASE-LR4 interface.

Suggested Remedy:
Add:
after reference to G.694.1

Response:
Estes, Dave
UNH - IOL
Comment Type: E  Comment Status: X
It is unclear how the Alignment markers are inserted without changing the PMA clock rate.

Suggested Remedy:
Insert a note indicating that columns of Idle will need to be deleted prior to the scrambler.
The number of columns to delete will be an average of 1 column of Idle for every 16384 MII columns, however this is just an average since the alignment markers will be inserted on all lanes at the same time.

Response:
Estes, Dave
UNH - IOL
Comment Type: E  Comment Status: X
Typo, "or" instead of "of"

Suggested Remedy:
Change "and has lots or transitions" to "and has lots of transitions"

Response:
Estes, Dave
UNH - IOL
Comment Type: T  Comment Status: X
The spacing of alignment markers is incorrectly stated as 16385 instead of 16384.

Suggested Remedy:
Change 16385 to 16384

Response:
Estes, Dave
UNH - IOL
Comment Type: T  Comment Status: X
test_am is currently defined similarly to test_sh which will cause the PCS alignment marker lock state diagram to run on every received 66-bit block, instead of only running the state diagram on candidates for valid alignment markers.

Suggested Remedy:
State that test_am is set to true when the Lane deskew process has accumulated enough bits (16384*66) from the PMA to evaluate the next alignment marker.

Response:
Estes, Dave
UNH - IOL
Comment Type: T  Comment Status: X
am_cnt is currently written to use the last 4 block received.

Suggested Remedy:
Change the definition to use a "4*16384 block window"

Response:
Cl 82 SC 82.2.17.2.4 P 133 L 5  # 254
Estes, Dave UNH - IOL

Comment Type T Comment Status X
am_invalid_cnt is currently written to use a 4 block window.

SuggestedRemedy
Change the definition to use a "4*16384 block window"

Proposed Response Response Status O

Cl 82 SC 2.17.2.5 P 133 L 19  # 255
Estes, Dave UNH - IOL

Comment Type T Comment Status X
31.25us_timer and 12.5us_timer are not referenced by the BER monitor state diagram.

SuggestedRemedy
Remove 31.25us_timer and 12.5us_time and define xus_timer as "Timer that is triggered every 31.25 us +1%, -25% (for 40GBASE-R) or 12.5 us +1%, -25% (for 100GBASE-R)"

Proposed Response Response Status O

Cl 82 SC 2.17.3 P 138 L  # 256
Estes, Dave UNH - IOL

Comment Type T Comment Status X
Using "am_status" as an exit condition from state LOSS_OF_ALIGNMENT is redundant. It is redundant because !am_status is a global transition to the same state.

SuggestedRemedy
Change the exit condition from LOSS_OF_ALIGNMENT to ALIGN_ACQUIRED to "alignment_valid"

Proposed Response Response Status O

Cl 82 SC 2.4.3 P 122 L  # 259
Estes, Dave UNH - IOL

Comment Type TR Comment Status X
The Block Payload descriptions for block types 0xb4, 0xcc, 0xd2, and 0xe1 are incorrect. They do not include enough single bit fields. 0xb4 should have 4 but only 3 are displayed, 0xcc should have 3 but only 2 are displayed, 0xd2 should have 2 but only 1 is displayed, 0xe1 should have 1 but none are displayed.

SuggestedRemedy
Add one single bit field to the Block Payload descriptions for block types 0xb4, 0xcc, 0xd2, and 0xe1.

Proposed Response Response Status O
Cl  SC  P  L  #  Comment ID
86  1  199 16 260 260
Vanderlaan, Paul Nexans
Comment Type E Comment Status X
Comment: Change from:
Table 86-1
Type A1a.2a (50/125 um multimode) “OM3”
Suggested Remedy
Change to:
Table 86-1
Type A1a.2a (50/125 um multimode) “OM3 or better”
Indicates higher performing fibers will be suitable
Proposed Response Response Status O

Cl  SC  P  L  #  Comment ID
82  82.2.4.5 123 37 263 263
Healey, Adam LSI Corporation
Comment Type E Comment Status X
Comment: It may be useful to point out that sequence and signal ordered set encoding differs from the encoding defined in Clause 49.
Suggested Remedy
Add a note to highlight this difference.
Proposed Response Response Status O

Cl  SC  P  L  #  Comment ID
82  82.2.4.3 122 12 264 264
Healey, Adam LSI Corporation
Comment Type E Comment Status X
Comment: In Figure 82-5, it could be made more clear which control block format corresponds to a sequence ordered set and which corresponds to a signal ordered set without requiring the reader to cross-reference to Table 82-1.
Suggested Remedy
Add a footnote to the table distinguishing the two ordered set block formats.
Proposed Response Response Status O

Cl  SC  P  L  #  Comment ID
82  82.2.4.10 123 37 262 262
Healey, Adam LSI Corporation
Comment Type E Comment Status X
Comment: It is not necessary to have two sub-clauses addressing ordered sets at the same level in the clause hierarchy.
Suggested Remedy
Merge information in 82.2.4.10 and 82.2.4.5.
Proposed Response Response Status O
### Comment 266

**Comment Type:** E  
**Comment Status:** X  
**Suggested Remedy:**

Receive process must also insert idles to compensate for removal of alignment markers. If the PCS receive process spans multiple clock domains, it may also perform clock rate compensation via the deletion of idles or sequence ordered sets or the insertion of idles.”

**Proposed Response:**

Suggest:

“The receive process must insert idles to compensate for the removal of alignment markers. If the PCS receive process spans multiple clock domains, it may also perform clock rate compensation via the deletion of idles or sequence ordered sets or the insertion of idles.”

**Response Status:** O

---

### Comment 267

**Comment Type:** T  
**Comment Status:** X  
**Suggested Remedy:**

Per the PCS deskew state diagram (Figure 82–14), the definition of deskew_error in 82.2.17.2 (page 130, line 51), and the use of align_status in the Receive state diagram (Figure 82–17, page 141, line 2), a spurious bit error that occurs during an alignment marker will suppress the receipt of all packets until the next next group of alignment markers arrives, which could be a significant number of packets. Hysteresis should be added to Figure 82-14 to avoid this hair-trigger behavior.

**Proposed Response:**

Modify state diagram such that four consecutive deskew_error indications are required to set align_status = FALSE. Due to the hysteresis in PCS alignment marker lock state diagram (Figure 82–13), it seems acceptable to set align_status = TRUE based on the single alignment_valid indication.

**Response Status:** O

---

### Comment 270

**Comment Type:** T  
**Comment Status:** X  
**Suggested Remedy:**

Amend last sentence of 73.5.1.1 to read: "When the PHY has 10GBASE-KX4, 40GBASE-KR4, 40GBASE-CR4, and 100GBASE-CR10 capability, DME pages shall be transmitted only on lane 0. The transmitters for unused lanes should be disabled as specified in 71.6.7, <insert appropriate cross-references>.”

**Proposed Response:**

**Response Status:** O
Comment Type: T  Comment Status: X

Receiver interference tolerance requirement is unclear. Annex 69A defines a test for a 10GBASE-KR receiver in isolation.

Does this requirement imply that a single 40GBASE-KR4 lane is tested in isolation? If so, should the unused lanes be terminated by the reference impedance, and what is their operational state (active or quiescent)?

If all lanes are to be tested in parallel, are parallel instances of the Annex 69A set-up required, or does a new multi-lane test apparatus need to be defined?

Suggested Remedy
A supporting presentation will be provided to compare several approaches to this problem and suggest a direction.

Proposed Response  Response Status: O

Comment Type: T  Comment Status: X

"Receiver characteristics are summarized in Table 85–5 and as detailed in 72.7.1.1 through 72.7.2.5 with the exception of the receiver characteristics specified in 85.8.4.1, 85.8.4.2, and 85.8.4.3."

Subclause 71.7.2.1, Receiver interference tolerance, which references Annex 69A, defines a test for a 10GBASE-KR receiver in isolation.

At the same time, subclause 85.8.4.1 states that "the receiver shall operate with a BER 10^-12 or better when receiving a compliant transmit signal, as defined in 85.8.3, through a compliant cable assembly as defined in 85.9 exhibiting the maximum insertion loss of 85.9.2."

This implies that all lanes as tested as an aggregate using a cable assembly model spanning TP2 to TP3.

Which requirement applies?

Suggested Remedy
A supporting presentation will be provided to compare several approaches to this problem and suggest a direction.

Proposed Response  Response Status: O

Comment Type: T  Comment Status: X

Clause 85 references Clause 72 in multiple places, yet uses a definition of TP1 and TP4 that is inconsistent with definition in Clause 72. This will inevitably lead to confusion.

Suggested Remedy
Define TP1 and TP4 in a manner consistent with their use in Clause 72, or add a note explaining the mapping.

Proposed Response  Response Status: O

Comment Type: T  Comment Status: X

This subclause states that "the skew budget that the PCS receiver must support is shown in Table 82–4." The skew budget in Table 82-4 presumes a concatenation of optional interfaces and a generous allocation for media skew that may not be present in every compliant implementation. Consider, for example, that a 40GBASE-KR4 PHY has a need for considerably less skew tolerance. By mandating a fixed tolerance, needless latency is introduced for this PHY type. One can expect a demand for low latency interfaces in the marketplace.

Also note that the receiver skew tolerance requirements are not defined in Clause 48 which defines similar deskew functionality.

Suggested Remedy
It is sufficient to define the maximum skew contributions for each component of a 40 Gb/s and 100 Gb/s link leading up to the input of the PCS receiver. These contributions may be summarized in a table (such as Clause 48, Table 48-5) so that the implementer may easily calculate the skew tolerance required for the targeted application. Remove the normative requirement for PCS skew tolerance (including Table 82-4).

Proposed Response  Response Status: O
Proposed Response

Change to read "...with each fault sequence separated by less than 128 columns and no intervening fault_sequences of a different fault value."

Suggested Remedy

Remove the note

Proposed Response

Move this text to be a note under the figure as is done for Figure 85-2 and 85-9

Proposed Response
Proposed Response
Delete this Editors Note

Proposed Response
Change "NOTE– Cross references that refer to clauses, tables, or figures not covered by this amendment are highlighted in dark blue." to "NOTE– Cross references that refer to clauses, tables, figures or equations not covered by this amendment are highlighted in dark blue."

Proposed Response
Remove underline from Table 45-58a page 43 line 5
Remove underline from Table 45-58b page 44 line 21
Space missing in "status register3" page 61 line 8
Space missing in "Table45-133" page 65 line 13

Proposed Response
Change "for e.g." to "e.g." in page 87 lines 18 and 21
Change "concepts of MiI:" to "concepts of the MiI:"
Change "implemented DIC" to "implemented the DIC" page 104 line 3
Change "a RXC" to "an RXC" page 106 line 38
Page 111 line 12 external reference to clause 21 should be blue

Proposed Response
Space missing in "isin" page 148 line 44

Proposed Response
Change "for 40GBASE-SR and 100GBASE-SR PMDs" to "for the 40GBASE-SR and 100GBASE-SR PMDs" page 143 line 22
Space missing in "isin" page 148 line 44

Proposed Response
Remove underline from Table 45-58a page 43 line 5
Remove underline from Table 45-58b page 44 line 21
Space missing in "status register3" page 61 line 8
Space missing in "Table45-133" page 65 line 13

Proposed Response
Change "PMA service interfaces" to "PMA service interface" page 115 line 47
Change "wide, data" to "wide data" page 117 line 9
Change "to 64B/66B block" to "to 64B/66B blocks" page 117 line 10
Change "markers are shown" to "markers is shown" page 126 line 20
Change "for 40GBASE-R PCS:" to "for the 40GBASE-R PCS:" page 126 line 47
External links "21.5" and "14.2.3.2" should be blue page 130 lines 1 and 2
All blue text in 82.2.18.1 are register numbers which should not be blue
Blue text in 82.2.18.4 is a register number which should not be blue

Proposed Response
Change "for 40GBASE-SR and 100GBASE-SR PMD" to "for the 40GBASE-SR and 100GBASE-SR PMDs" page 143 line 22
Space missing in "isin" page 148 line 44
# IEEE P802.3ba D1.0 40Gb/s and 100Gb/s Ethernet comments

## Task force Review

<table>
<thead>
<tr>
<th>CI</th>
<th>SC</th>
<th>P</th>
<th>L</th>
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<td>199</td>
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<td>SC 86.6.1</td>
<td>208</td>
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<td>SC 83A.1</td>
<td>281</td>
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### Comment 287

**CI:** 84  **SC:** 84.7.6  **P:** 165  **L:** 33  **#:** 287

**Anslow, Peter**  Nortel Networks

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

Two very minor editorial issues in clause 84 collected in to one comment.

**Suggested Remedy**

- Note 2 is in 10 point font rather than the usual 9 point font page 165 line 33
- External references to clause 21 should be blue page 168 lines 15 and 48

**Proposed Response**

Response Status: O

### Comment 288

**CI:** 85  **SC:** 85.1  **P:** 171  **L:** 10  **#:** 288

**Anslow, Peter**  Nortel Networks

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

Several very minor editorial issues in clause 85 collected in to one comment.

**Suggested Remedy**

- Reference to Clause 45 should be cross-reference page 171 line 10
- The dash between 81 and RS should be an em-dash page 171 line 18
- The dash between 73 and Auto-Negotiation should be an en-dash page 171 line 30
- Change "interface for these" to "interfaces for these" page 172 line 45
- Reference to Clause 45 should be cross-reference page 174 line 49
- Space missing in "disable 9to" page 175 line 17
- The word "Global_" is in 10 point font right side of page 175 line 33
- Force the second "PMD" to next line on left side of page 175 line 35
- Change ". . . " to ". . . " page 177 line 10
- Remove space between "PMD_SIGNAL.indication" and "(SIGNAL_DETECT)" in two places page 178 lines 38 and 39
- Change "When a Global_PMD_. . . " to "When Global_PMD_. . . " page 179 line 24
- Change "NOTES" 1 to "NOTE1" page 179 line 51
- Change "2" to "NOTE2" page 180 line 3
- It would be useful to colour external equation references blue (see comment on front matter) page 181 lines 28, 29, 30, 31 also page 183 lines 18 an 19
- Set pagination to "Anywhere" to remove blank half page for heading 85.9.1 page 185 line 1
- Do Special, Equations, Equations, "shrink wrap" on equation 85-6 to fix cropping page 187 line 26
- External reference to clause 21 should be blue page 197 line 11

**Proposed Response**

Response Status: O

### Comment 289

**CI:** 86  **SC:** 86.1  **P:** 199  **L:** 34  **#:** 290

**Anslow, Peter**  Nortel Networks

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

Several very minor editorial issues in clause 86 collected in to one comment.

**Suggested Remedy**

- Clause 1 should be an internal cross-reference page 199 line 34
- Annex A should be an internal cross-reference page 199 line 35
- Clause 45 should be an internal cross-reference page 199 line 40
-Clause 45 should be an internal cross-reference page 203 line 21
- " . . " missing at the end of the sentence page 209 line 54
- Separator too thick below "Nominal core diameter" page 219 line 22

**Proposed Response**

Response Status: O

### Comment 290

**CI:** 86  **SC:** 86.6.1  **P:** 208  **L:** 11  **#:** 290

**Anslow, Peter**  Nortel Networks

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

In Table 86-6 The "TP1a Deterministic Jitter output" min and max values are blank

Same issue for Table 86-7 "AC common mode input voltage tolerance" max

**Suggested Remedy**

- Make the "TP1a Deterministic Jitter output" min "-" and the Max "TBD" if no values are available
- Make the "AC common mode input voltage tolerance" max "-"

**Proposed Response**

Response Status: O

### Comment 291

**CI:** 83A  **SC:** 83A.1  **P:** 281  **L:** 6  **#:** 291

**Anslow, Peter**  Nortel Networks

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

Several very minor editorial issues in clause 83A collected in to one comment.

**Suggested Remedy**

- Change "example application of XLAUI includes providing lane" to "example application of XLAUI is to provide lane" page 281 line 6
- Remove spurious empty paragraph from page 282 line 39
- Use the ++ symbol (Ctrl-q 1) page 283 line 14 and page 286 line 32
- Use Greater than or equal to sign (Ctrl-q 3) and Less than or equal to sign (Ctrl-q #) page 284 line 38, page 285 line 2 and page 288 line 5
- Space missing in "10MHz" page 284 line 48

**Proposed Response**

Response Status: O
Cl 86 SC 86.7.4.7.1 P 216 L 1 # 292
Anslow, Peter Nortel Networks

Comment Type E Comment Status X
Clause 86.7.4.7.1 "Eye mask for TP1a and TP4" should be a subclause of 86.7.3
"Electrical parameters" and not 86.7.4 "Optical parameter definitions"

SuggestedRemedy
Move the "Eye mask for TP1a and TP4" clause to 86.7.3

Proposed Response Response Status O

Cl 86 SC 86.6.1 P 208 L 10 # 293
Anslow, Peter Nortel Networks

Comment Type T Comment Status X
In Table 86-6 there are two jitter parameters "Maximum Total Jitter" and "Maximum
Determined Jitter" where it is not clear if this is UI peak to peak or not. Also applies to:
Table 86-7 "Total Jitter tolerance at TP1a"
Table 86-11 "Total Jitter output at TP4"
Table 86-12 "Total Jitter tolerance"

SuggestedRemedy
Either change the parameter names to include "(pk-pk)" or change the units to be Ultp

Proposed Response Response Status O

Cl 87 SC 87.11 P 239 L 15 # 296
Anslow, Peter Nortel Networks

Comment Type T Comment Status X
In Table 87-13 the value of DGD_max is "TBD". The DGD_max value for 10GBASE_LR in
Table 52-24 is 10 ps. This equates to a link PMD coefficient of 0.8 ps/sqrt(km) (assuming
S = 3.75) and is expected to give only a small penalty at 10.3125 GBd.

SuggestedRemedy
In Table 87-13 set the value of DGD_max to 10 ps
See anslow_04_1108.pdf for more detail.

Proposed Response Response Status O

Cl 88 SC 88.12 P 262 L 15 # 297
Anslow, Peter Nortel Networks

Comment Type T Comment Status X
In Table 88-17 the values of DGD_max for 100GBASE-LR4 and 100GBASE-ER4 are
"TBD"

SuggestedRemedy
Set DGD_max for 100GBASE-LR4 to 10 ps
Set DGD_max for 100GBASE-ER4 30 km to 10.3 ps
Set DGD_max for 100GBASE-ER4 40 km to 10.3 ps
See anslow_04_1108.pdf for detailed justification.

Proposed Response Response Status O
<table>
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<th>SC</th>
<th>P</th>
<th>L</th>
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<td>86</td>
<td>86.4.2</td>
<td>205</td>
<td>1</td>
<td>T</td>
<td>X</td>
<td>DT diagrams clear and consistent with symbols for optical and electrical connectors</td>
<td>Replace Figures 86-1, 87-1 and 88-1 with those shown in anslow_05_1108.pdf</td>
<td></td>
</tr>
<tr>
<td>299</td>
<td>82</td>
<td>82.2.8</td>
<td>126</td>
<td>33</td>
<td>TR</td>
<td>X</td>
<td>DT lane markers for 40GBASE-R and 100GBASE-R</td>
<td>If different lane markers are agreed for 40GBASE-R from 100GBASE-R then use the values in anslow_06_1108.pdf as the lane markers for 40GBASE-R</td>
<td></td>
</tr>
<tr>
<td>300</td>
<td>80</td>
<td>3</td>
<td>89</td>
<td>34</td>
<td>TR</td>
<td>X</td>
<td>Change TBD fields for 40GBASE-R and 100GBASE-R</td>
<td>Change the TBD fields for 40GBASE-R PCS round trip delay to: 11264 bit time in column 2, and 22 pause quanta in column 3. Change the TBD fields for 100GBASE-R PCS round trip delay to: 35328 bit time in column 2, and 69 pause quanta in column 3. Supplemental material is provided in support of this remedy.</td>
<td></td>
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<tr>
<td>301</td>
<td>80</td>
<td>3</td>
<td>89</td>
<td>35</td>
<td>TR</td>
<td>X</td>
<td>Footnote to Table 86-1: Should we add reference to the TIA-492AAAC-A standard. The IEC standard is currently referenced.</td>
<td></td>
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<tr>
<td>302</td>
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<td>86.1</td>
<td>199</td>
<td>23</td>
<td>TR</td>
<td>X</td>
<td>Remove the word &quot;with&quot;. This appears to be a typographical error.</td>
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The commenter has used old clause numbers. Changed Clause number from 150 to 80
<table>
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<tr>
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<td>Oulundsen III, George OFS</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Table 86-12: I believe that the footnote superscript &quot;a&quot; should be added to the &quot;Deterministic Jitter tolerance (pk-pk)&quot; value of 0.40 in the &quot;Min&quot; column of the table. I believe that this is a typographical error.</td>
<td></td>
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<tr>
<td>SuggestedRemedy</td>
<td></td>
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<td># 304</td>
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| Cl | SC 86.6.5.1 | E | Comment Status X |
| Oulundsen III, George OFS |
| Footnote to Table 86-13: Should we add the TIA-492AAAC-A standard to footnote a. The IEC standard is already referenced. |
| SuggestedRemedy |
| Proposed Response | Response Status O |
| # 305 |

| Cl | SC 86.10.1 | T | Comment Status X |
| Oulundsen III, George OFS |
| Table 86-17: Currently, there are a lot of TBDs regarding skew constraints. The 802.3ba Task Force adopted kolesar_02_0508.xls as the MMF cable skew spreadsheet model. At that time we understood that the values could change, but the concept of the model spreadsheet was adopted. Should we use the values proposed in kolesar_02_0508.xls as a starting point and replace the TBD with the model values where we can? Better values can be entered when discovered. |
| SuggestedRemedy |
| Proposed Response | Response Status O |
| # 308 |
Proposed Response

Given the target distance of 100 meters, we need to evaluate the possibility of eliminating the encircled flux specification. This will likely be a challenging specification to meet over temperature (or even at a single temperature on all lanes) for a parallel optical module. General discussions on the expected impairment in modal bandwidth for an overfilled as opposed to restricted launch into OM3 fiber suggest that eliminating encircled flux may be possible, but further analysis of this question by an ad-hoc group may be necessary.

Suggested Remedy

Eliminate the encircled flux specification from Table 86-8 and any other places referenced in these clauses.

Proposed Response

The lane wavelengths used for the 40GBASE-LR4 PMD should be the same as the wavelengths used for the Clause 53 10GBASE-LX4 PMD. This will allow maximum re-utilization of laser and optical demultiplexer technologies developed for 10GBASE-LX4. Reducing development costs have a direct impact on the economic feasibility of this project. It would be a mistake to walk away from a technology investment that has been paid for and proven over years of manufacturing. Additionally, the proposed reduction of the channel bandwidth from 13.4 nm (10GBASE-LX4) to 13 nm (40GBASE-LR4) would have some impact on laser yields and consequently cost. In order to allow a 0-70 C module operating range, the lasers need to be in spec from -5 to +85C. Assuming 0.1 nm/C, 9 nm of the band is taken by temperature. Approximately 1.5 nm is allocated for guard bands. Consequently, the window that is being targeted for laser operation at a given temperature is 2.5 nm for the proposed 40GBASE-LR4 versus 2.9 nm for 10GBASE-LX4.

Suggested Remedy

Change all references for L0, L1, L2, and L3 to match the wavelength specifications in Clause 53 (10GBASE-LX4).

Proposed Response

The paragraph quoted has several problems and seems to have no purpose beyond advertisement. Any reader of a document like this will be above such material. 'The 40 and 100 Gigabit Ethernet extends the IEEE 802.3 protocol to operating speeds of 40 Gb/s and 100 Gb/s. The bit rate is faster and the bit times are shorter—both in proportion to the change in bandwidth while maintaining maximum compatibility with the installed base of IEEE 802.3 interfaces. The minimum packet transmission time has been reduced by a factor of four for 40 Gb/s and ten for 100 Gb/s.' Extends? will be wrong when .3ba is rolled into the base standard. 'bandwidth' is wrong term. 'while maintaining maximum compatibility with the installed base of IEEE 802.3 interfaces' There is very little compatibility with the installed base of IEEE 802.3 interfaces intended (and none spelled out in the objectives). 'packet transmission time' means? For links up to 10 and 40 km, transmission time is substantially determined by the speed if light, not the MAC rate. 'factor of four' as compared with what?

Suggested Remedy

Delete the paragraph. Anyone who thinks it leaves a void can bring in something better next time.

Proposed Response

Clause 74 FEC is applicable to all these port types. Whether we like it or not, it can be applied. At least as far as error detection, it should be mandatory for 40GBASE-CR4 and 100GBASE-ER10. I expect it will turn out to be a practical necessity for 100GBASE-ER4.

Suggested Remedy

Make Clause 74 FEC mandatory for 40GBASE-CR4 and 100GBASE-CR10, optional for all other port types in this table. The distinction between mandatory FEC detection and mandatory FEC correction can be explained elsewhere.

Proposed Response
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<tbody>
<tr>
<td>313</td>
<td></td>
<td>314</td>
<td></td>
<td>315</td>
<td></td>
</tr>
<tr>
<td>316</td>
<td></td>
<td>317</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Comment 313

#### 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
- O: Open
- W: Written
- C: Closed
- U: Unsatisfied
- Z: Withdrawn

#### Comment ID
- Cl 80
- SC 80.2.3
- P 88
- L 23

#### Proposed Response

- Auto-negotiation is an unnecessary burden on front-side ports. See another comment.

#### Suggested Remedy

- Provide two columns under '73'. Auto-negotiation M for 40GBASE-KR4 only (blank for all others), Link Negotiation (if we keep that name) O or M as decided for 40GBASE-CR4 and 100GBASE-CR10. Revise 82.2.20.

### Comment 314

#### Comment Type
- E: Editorial

#### Comment Status
- X

#### Proposed Response

- 'Editor's note... The service interface notation used in 802.3ba PMD PMA clauses have some differences from the notations used for 10GbE sublayer interfaces. The differences need to be explained in the introductory Clause 80. The definitions and notation for service interfaces in 802.3ba PMD/PMA will be reconciled during TF review, as per the service interface definitions specified in 1.2.2.' What is the difference/issue?

#### Suggested Remedy

- If found to be OK, delete this and similar notes.

### Comment 315

#### Comment Type
- T: Technical

#### Comment Status
- X

#### Proposed Response

- MAC Control PAUSE can't be used with long links because the round trip latency becomes too much to cope with. At each higher MAC rate, this is even more true. If the entity above the MAC wants to know the round trip latency, it should use Ping or similar method to find it out for a particular link. Even with this table, for many port types there is no guarantee that the nominal maximum latency is not exceeded because 'A PMD which exceeds the operational range requirement while meeting all other optical specifications is considered compliant'.

#### Suggested Remedy

- Remove the table rows for 40GBASE-LR4 PMD, 100GBASE-LR4 PMD and 100GBASE-ER4 PMD. Delete 87.2.1 and 88.2.1, change '87.2 Delay and skew' to '87.2 Skew', similarly 88.2.

### Comment 316

#### Comment Type
- T: Technical

#### Comment Status
- X

#### Proposed Response

- With multi-lane sublayers, these time units are confusing. 'bit time' was always confusing to PMD and PMA engineers.

#### Suggested Remedy

- Add a column in ns. Consider deleting one of the two 'Maximum' columns in D3.0. If we keep a column in bit times, change 'bit time' to 'MAC bit time'.

### Comment 317

#### Comment Type
- T: Technical

#### Comment Status
- X

#### Proposed Response

- TBDs

#### Suggested Remedy

- Accept the proposed Round-trip delay limit for 40GBASE-SR4 and 100GBASE-SR10.
Draft 1.0 Comments

IEEE P802.3ba D1.0 40Gb/s and 100Gb/s Ethernet comments

Task force Review

Cl 81 SC 81.3.1.3 P 102 L 7 # 318
Dawe, Piers
Avago Technologies

Comment Type T Comment Status X

Some of the lines shown are impossible with the hex values given.

Suggested Remedy
Remove the lines below '0xFF' and above '0x00'. Also Fig. 81-6, 81-7.

Proposed Response Response Status O

Cl 81 SC 81.3.4 P 108 L 22 # 319
Dawe, Piers
Avago Technologies

Comment Type T Comment Status X

Decide once and for all whether to allow 'unidirectional' operation at 40 and 100G. Per conversation at last meeting, it seems it's possibly helpful for an unprotected link, probably harmful for a protected link. Will there be unprotected managed 40G or 100G Ethernet links?

Suggested Remedy
Decide and write it down. If we do allow unidirectional, the bad Hamming distance of the Sequence ordered_sets might be worth changing.

Proposed Response Response Status O

Cl 82 SC 82.1.1 P 113 L 23 # 321
Dawe, Piers
Avago Technologies

Comment Type T Comment Status X

'medium be compliant at the PMA level.' The medium is not at the PMA level, and not connected directly to the PMA. Also, there could be FEC between PMA and PCS.

Suggested Remedy
Does this work: 'The 40GBASE-R and 100GBASE-R PCSs can operate with any full duplex medium requiring only that the sublayers below the PCS provide a compliant service interface to the PCS.'

Proposed Response Response Status O

Cl 74 SC 74.7.4.5 P 79 L 46 # 322
Dawe, Piers
Avago Technologies

Comment Type TR Comment Status X

The moderate power taken by FEC is spent four ways: encoding (basically a CRC generation), error detection (CRC checking), error correction, and re-coding as non-FEC 64B/66B and error marking. A significant fraction of the power and complexity goes in error correction; all the rest is straightforward. Most of the latency is taken by error correction and optional PCS error marking. In some scenarios e.g. a copper cable approaching 10 m, we need FEC for its error detection. In other scenarios e.g. 40GBASE-KR4, 100GBASE-ER4, we do (or should) allow FEC for its error detection as well. But when a particular link is up and running, a receiver that is happy with its received BER can switch the correction off, with no need for handshaking with the transmitter. This still gives excellent error detection, and remains compatible with PCS error indication. In principle this could be done lane by lane but the remedy below treats all the lanes as a group. There is another comment for Clause 74.

Suggested Remedy
Add sentence 'For reduced power, latency and complexity, in some circumstances the FEC decoder detects errors but does not attempt to correct them. These circumstances are explained in the relevant PMD clauses e.g. Clause 84 to Clause 88.'
I intend to provide a short presentation showing the difference between error detection and error correction.

Proposed Response Response Status O
**Comment ID # 323**

**Cl 80 SC 80.2.3 P 88 L 45 # 323**

Dawe, Piers
Avago Technologies

**Comment Type** T

**Comment Status** X

Good introductory material overlooked in 82.1.3.

**Suggested Remedy**

Either add sentence here 'The functions of the PCS, FEC, PMA, PMD and AN sublayers are summarized in 82.1.3.' or move 82.1.3. into 80.2.

**Proposed Response**

**Response Status** O

---

**Comment ID # 324**

**Cl 82 SC 82.1.3.2 P 115 L 6 # 324**

Dawe, Piers
Avago Technologies

**Comment Type** T

**Comment Status** X

Missing sublayers

**Suggested Remedy**

Add new subclauses summarizing the FEC and AN sublayers.

**Proposed Response**

**Response Status** O

---

**Comment ID # 325**

**Cl 82 SC 82.2 P 116 L 48 # 325**

Dawe, Piers
Avago Technologies

**Comment Type** T

**Comment Status** X

This PCS is extremely like the Clause 49 PCS. It costs a lot of unnecessary time going through it with a fine toothcomb to find where there are differences and where there are not.

**Suggested Remedy**

Please add a subclause listing the similarities and differences. You might want to cover yourself by making it informative.

**Proposed Response**

**Response Status** O

---

**Comment ID # 326**

**Cl 83A SC 83A.2 P 282 L 19 # 328**

Dawe, Piers
Avago Technologies

**Comment Type** TR

**Comment Status** X

The primary purpose of the nAUI spec is the same as the XFI spec at 10G: to provide a standardised and interoperable spec for plugging retimed transceiver modules into line cards or similar. Like XFI (part of XFP), it needs to take a connector into account (does not need to define the connector mechanicals) and define the compliance points with reference to the connector.

**Suggested Remedy**

Use the six TP compliance points defined in 86.7.1, relagate the points in Fig 83A-2 to informative reference points like A and D in SFP+.

**Proposed Response**

**Response Status** O
Comment Type: TR/technical required  ER/editorial required  GR/general required  T/technical  E/editorial  G/general
COMMENT STATUS: D/dispatched  A/accepted  R/rejected  RESPONSE STATUS: O/open  W/written  C/closed  U/unsatisfied  Z/withdrawn
SORT ORDER: Comment ID
Ci: 83 SC: 83.3.1.1 P: 150 L: 6
Dawe, Piers Avago Technologies

Comment Type: E  Comment Status: X

Comment: PMA_UNITDATA.inputx (input_bit_lane_x)

Suggested Remedy:
- PMA_UNITDATA.inputx(input_bitLane_x)
  - i.e. without the space. Same in following subclauses.

Proposed Response:  Response Status: O

---

Ci: 82 SC: 82.1.6 P: 116 L: 29
Dawe, Piers Avago Technologies

Comment Type: E  Comment Status: X

Comment: PMA_UNITDATA.indicate

Suggested Remedy:
- PMA_UNITDATA.indication
- Search and replace, 10 instances

Proposed Response:  Response Status: O

---

Ci: 83 SC: 83.6.2 P: 153 L: 28
Dawe, Piers Avago Technologies

Comment Type: T  Comment Status: X

Comment: What does 'Tx PMA implemented synchronously with PCS' mean? For PMA implemented together with PCS, or integrated with PCS, surely the spec is 'Not applicable'?

Suggested Remedy:
- For a Tx PMA receiving from the PCS, I believe 25 ps (which is 0.25 UI at 10 GBd) is adequate: see another comment for explanation.

Proposed Response:  Response Status: O

---

Ci: 85 SC: 85.9.2 P: 185 L: 17
Dawe, Piers Avago Technologies

Comment Type: T  Comment Status: X

Comment: Specification range for cable insertion loss is not adequate at either end. SFP+ Annex E cable S-parameter specs go from 10 MHz to 11.1 GHz.

Suggested Remedy:
- Extend the range of Cable assembly insertion loss, Cable assembly return loss, Near-End Crosstalk, MDNEXT, FEXT and MDSEL_FEXT to at least 10 MHz to 10 GHz.

Proposed Response:  Response Status: O
Auto-negotiation is an unnecessary burden on the host. It is not necessary for these copper links, and should not appear on front-panel ports.

**Suggested Remedy**
Delete Auto-negotiation from Clause 85. Remove the Note at Clause 73, but provide a table showing which port types could use Auto-negotiation proper, which could use Parallel Detection (see below), and which could use Training. Formalize and extend 'Parallel Detection' (73.7.4.1 Parallel Detection function) as a properly specified Link Negotiation based on the principles of Fibre Channel's Link Speed Negotiation. See presentation.

**Proposed Response**

It is very good that TP1, TP2, TP3, TP4 are positioned in relation to the connector, but not clear enough where they are exactly with respect to the connector. While for some measurements like S-parameter measurements on a passive cable, de-embedding can be used to infer the performance right next to the connector, for measurements of nonlinear active elements like transmitters and receivers, in general this cannot be done.

**Suggested Remedy**
Use the same defined reference losses between each TP and the connector as in Clause 86; this includes specifying the loss between PMD and TP2 in 85.8.3.1 Fig 85-3. For the S-parameter specs, where de-embedding is viable, give the equivalent de-embedded specs also so that the cables can be assessed using either approach.

**Proposed Response**
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>CL</th>
<th>SC</th>
<th>Page</th>
<th>Line</th>
<th>Comment Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>346</td>
<td>86</td>
<td>86.4.1</td>
<td>204</td>
<td>30</td>
<td>Dawe, Piers Avago Technologies</td>
</tr>
<tr>
<td>347</td>
<td>86</td>
<td>86.5</td>
<td>207</td>
<td>18</td>
<td>Dawe, Piers Avago Technologies</td>
</tr>
<tr>
<td>348</td>
<td>86</td>
<td>86.6.3</td>
<td>210</td>
<td>6</td>
<td>Dawe, Piers Avago Technologies</td>
</tr>
<tr>
<td>349</td>
<td>01</td>
<td>1.3</td>
<td>22</td>
<td>52</td>
<td>Dawe, Piers Avago Technologies</td>
</tr>
</tbody>
</table>

**Comment Type**
- **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

**Suggested Remedy**
- Editor's note
- See Anslow presentation and comment, remove editor's note
- Per comment
- Use text from SFF-8431 D3.1 with appropriate modifications (this is not issued at time of writing but will be issued before the P802.3ba co-located interim)
- Use text from SFF-8431 D3.1 with appropriate modifications (this is not issued at time of writing but will be issued before the P802.3ba co-located interim)
- Remove the footnote here.
- Check that we have allowed enough for 100 m of fibre and a reasonable number of connectors, remember that with a restricted launch, the actual connector loss is less than the measured connector loss. Reduce the numbers in the minimum column by 0.1 dB if appropriate, and adjust Table 86-13, fill in TBDs in 86.10.2.2.1. Remove the footnote here.
- 'Change the following reference... Laser Diodes.' with another entry for the 'Insert' list, TIA-455-127-A-2006, FOTP-127-A—Basic Spectral Characterization of Laser Diodes.
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
<th>Proposed Response</th>
<th>Response Status</th>
<th>Task force Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>352</td>
<td>T</td>
<td>X</td>
<td>Another reference for the list (not sure if it's a normative or informative reference)</td>
<td>Add G.709</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>353</td>
<td>T</td>
<td>X</td>
<td>Need a channel S-parameter equation</td>
<td>One way to develop one would be to scale the SFP+ channel by the ratio of recommended trace lengths, but the SFP+ equations don't have f^3 terms.</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>354</td>
<td>T</td>
<td>X</td>
<td>As we are not doing the maintenance work to remove all references to ANSI/EIA/TIA-455-127-1991, we can't do this by a 'change'. But we should add the new TIA-455-127-A to the normative references, so no point adding it here also. Nothing to do.</td>
<td>Delete 'Change B8 as follows... Lasers Diodes.'</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>355</td>
<td>T</td>
<td>X</td>
<td>Skew of medium per Gustlin is 45 UI (4.5 ns).</td>
<td>If this seems high, revisit the stress assumptions in the skew model.</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>356</td>
<td>T</td>
<td>X</td>
<td>3.5 dB/km for fibre cable loss seems pretty gross, much higher than the uncabled fibre loss. Is it still that bad?</td>
<td>?</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>357</td>
<td>T</td>
<td>X</td>
<td>A question and two editor's notes on this page</td>
<td>Consult the experts and clear up.</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>358</td>
<td>E</td>
<td>X</td>
<td>SFP+ D3.1 should be available</td>
<td>Update reference Bx2</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>Comment ID</td>
<td>Comment Type</td>
<td>Comment Status</td>
<td>Suggested Remedy</td>
<td>Proposed Response</td>
<td>Response Status</td>
<td></td>
</tr>
<tr>
<td>------------</td>
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<td>------------------</td>
<td>-------------------</td>
<td>-----------------</td>
<td></td>
</tr>
<tr>
<td>360</td>
<td>T</td>
<td>X</td>
<td>Isn't it quite feasible to interoperate between a nAUI lane and an XFI spec part? Even to comply to both at once?</td>
<td>Continue learning how to stop Frame from doing this!</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>360</td>
<td>T</td>
<td>X</td>
<td>Unless this is not so, say that this spec is similar to XFI (part of XFP), add reference for XFP document.</td>
<td></td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>361</td>
<td>E</td>
<td>X</td>
<td>Table too narrow</td>
<td>Resize LH column to contents</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>362</td>
<td>T</td>
<td>X</td>
<td>If you have stated the signalling rate there is no need to give the unit interval, and 'Baud period' is slang.</td>
<td>Delete 'The corresponding Baud period is nominally 96.96969697 ps.' and the similar row in Table 83A-1.</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>363</td>
<td>ER</td>
<td>X</td>
<td>Editor's note says 'The Return Loss limits in Figure 83A–4 and Figure 83A–7 may have to be plotted in log linear scale with loss being positive. The definition or formatting to be reconciled similar to the definition or plots in base spec 802.3-2008 Annex 69B'. Just because another clause did or didn't use a log frequency scale does not tie our hands. Just because another clause didn't use S-parameters doesn't preclude us from using S-parameters.</td>
<td>Do the right thing for our circumstances. S-parameters are good. Vertical grid lines would be welcome.</td>
<td>O</td>
<td></td>
</tr>
<tr>
<td>364</td>
<td>T</td>
<td>X</td>
<td>As one of these lines is the same as a line in Fig 83A-4</td>
<td>Remove this figure and put the four limits (three traces) on Fig 83A-4 (extending the vertical scale to -16).</td>
<td>O</td>
<td></td>
</tr>
</tbody>
</table>
IEEE P802.3ba D1.0 40Gb/s and 100Gb/s Ethernet comments

Dawe, Piers
Avago Technologies

Comment Type: T
Comment Status: X
(non-EQ Jitter (TJ - ISI)) There's no definition of what 'non-EQ Jitter' means in this document, nor this usage of 'ISI'. I suspect if I saw one I would not agree with it ;-) 

Suggested Remedy

Find a better metric, or explain these terms.

Proposed Response
Response Status: O

Comment Type: T
Comment Status: X

Like a PMA or PCS clause, nAUI is completely on a single line card or similar, so the draft doesn't need environmental specifications for it.

Suggested Remedy

Delete the subclause

Proposed Response
Response Status: O

Comment Type: T
Comment Status: X

Won't 100GBASE–ER4 suffer from SOA noise and will benefit from FEC to achieve a suitably low BER reliably?

Suggested Remedy

Add FEC to Table 88-1, at least as an option, and I suspect mandatory for 100GBASE–ER4. Do more investigation to find out if it needs be mandatory: maybe only for the longest links.

Proposed Response
Response Status: O

Comment Type: E
Comment Status: X

I doubt that errata for all the world's standards are available at this URL.

Suggested Remedy

Change 'all other standards' to 'all other IEEE standards'

Proposed Response
Response Status: O

Comment Type: TR
Comment Status: X

The copper-cable receivers are expected to rely even more on long DFE than Backplane Ethernet, and so when errors happen, moderately long error bursts are very probable. This overwhelms the CRC's error-detecting guarantee. These port types do not go into closed systems as Backplane Ethernet ports do, so the standard has to take responsibility for avoiding false packet acceptance rather than the system implementer.

Suggested Remedy

FEC encoding and error detection must be mandatory, to provide adequate error detection. This is significantly less onerous than requiring mandatory full FEC error correction (correcting errors is a step beyond detecting them) which can remain optional.

Proposed Response
Response Status: O
<table>
<thead>
<tr>
<th>#</th>
<th>Comment ID</th>
<th>Comment Type</th>
<th>Suggested Remedy</th>
<th>Proposed Response</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>371</td>
<td>Cl 99 SC 99 P 3 L 8</td>
<td>E</td>
<td>consciously</td>
<td></td>
<td>O</td>
</tr>
<tr>
<td>372</td>
<td>Cl 99 SC 99 P 4 L 5</td>
<td>E</td>
<td>consciously</td>
<td></td>
<td>O</td>
</tr>
<tr>
<td>373</td>
<td>Cl 99 SC 99 P 10 L 49</td>
<td>E</td>
<td>consciously</td>
<td></td>
<td>O</td>
</tr>
<tr>
<td>374</td>
<td>Cl 84 SC 84.8 P 166 L 16</td>
<td>TR</td>
<td>There is a newer version of this page</td>
<td></td>
<td>O</td>
</tr>
</tbody>
</table>

Comment: 84.8 refers to 72.7, which says "...the PMD sublayer is standardized at test points TP1 and TP4 as shown in Figure 72-1. The electrical path from the transmitter block to TP1, and from TP4 to the receiver block, will affect link performance and the measured values of electrical parameters used to verify conformance to this standard. Therefore, it is recommended that this path be carefully designed." In other words, there is no expectation that a board from vendor A, a backplane from B and another board from C can be expected to interoperate reliably, because each of them can spend as much of the shared channel budget as he pleases. This is not an interoperability spec, it's just an advertisement for some ICs. Is this what we want?

Suggested Remedy: Discuss. Options are: make it into a proper interoperability spec with test points related to the connectors (Clause 86 will have to do much of that work anyway), delete the clause, move it to an annex, or accept that it's not a proper spec.
The moderate power taken by FEC is spent four ways: encoding (basically a CRC generation), error detection (CRC checking), error correction, and re-coding as non-FEC 64B/66B and error marking. A significant fraction of the power and complexity goes in error correction; all the rest is straightforward. Most of the latency is taken by error correction and optional PCS error marking. In some scenarios e.g. a copper cable approaching 10 m, we need FEC for its excellent error detection capability. In other scenarios e.g. 40GBASE-KR4, 100GBASE-ER4, we do (or should) allow FEC for its error detection as well.

But when a particular link is up and running, a receiver that is happy with its received BER can switch the correction off, with no need for handshaking with the transmitter. This still gives excellent error detection, and remains compatible with PCS error indication. In principle this could be done lane by lane but the remedy below treats all the lanes as a group. There is another comment for Clause 74, and a short presentation.

**Suggested Remedy**

Add another register bit in Table 45-61, 1.170.2

xxx FEC error correction disable ability

A read of 1 in this bit indicates that the xxx FEC sublayer is able to operate while detecting but not correcting received errors.

RO

Insert new 45.2.1.84.1 xxx FEC error correction disable ability (1.170.2)

When read as a one, bit 1.170.2 indicates that the xxx FEC decoder is able to operate while detecting but not correcting received errors (see 74.7.4.5). When read as a zero, the xxx FEC decoder is not able to operate while detecting but not correcting received errors.

Add another register bit in Table 45-62, 1.171.2

FEC error correction disable

A write of 1 to this bit configures the xxx FEC decoder to operate while detecting but not correcting received errors.

R/W

Insert new 45.2.1.85.1 10 Gb/s FEC error correction disable ability (1.171.2)

This bit instructs the xxx FEC decoder to operate while detecting but not correcting received errors (see 74.7.4.5).

When bit 1.171.2 written as a one, the xxx FEC decoder shall operate while detecting but not correcting received errors (see 74.7.4.5). When bit 1.171.2 is written as a zero, the xxx FEC decoder shall either correct as well as detect received errors according to 74.7.4.5, or neither detect nor correct, as determined by bits 1.170.0 and 1.171.0.

The default value of bit 1.171.2 is zero.

**Proposed Response**

Add another register bit in Table 45-61, 1.170.2

xxx FEC error correction disable ability

A read of 1 in this bit indicates that the xxx FEC sublayer is able to operate while detecting but not correcting received errors.

RO

Insert new 45.2.1.84.1 xxx FEC error correction disable ability (1.170.2)

When read as a one, bit 1.170.2 indicates that the xxx FEC decoder is able to operate while detecting but not correcting received errors (see 74.7.4.5). When read as a zero, the xxx FEC decoder is not able to operate while detecting but not correcting received errors.

Add another register bit in Table 45-62, 1.171.2

FEC error correction disable

A write of 1 to this bit configures the xxx FEC decoder to operate while detecting but not correcting received errors.

R/W

Insert new 45.2.1.85.1 10 Gb/s FEC error correction disable ability (1.171.2)

This bit instructs the xxx FEC decoder to operate while detecting but not correcting received errors (see 74.7.4.5).

When bit 1.171.2 written as a one, the xxx FEC decoder shall operate while detecting but not correcting received errors (see 74.7.4.5). When bit 1.171.2 is written as a zero, the xxx FEC decoder shall either correct as well as detect received errors according to 74.7.4.5, or neither detect nor correct, as determined by bits 1.170.0 and 1.171.0.

The default value of bit 1.171.2 is zero.
Comment Type: T
Comment Status: X

New figures in new clauses should do things properly.

Suggested Remedy:
Use upper and lower case as normal, e.g., change 'LAN CSMA/CD LAYERS' to 'LAN CSMA/CD layers'. Also in following clauses.

Proposed Response
Response Status: O

Comment Type: E
Comment Status: X

'It is important to note that': is just padding. If it didn't matter, we wouldn't say it.

Suggested Remedy:
Delete

Proposed Response
Response Status: O

Comment Type: TR
Comment Status: X

The TBDs in 86.10.2.2.1 are inconsistent with the standard cabling model shown in Fig 86-5

Suggested Remedy:
Make text consistent with other SR applications. Paragraph should become:
The maximum link distances for multimode fiber are calculated based on an allocation of 1.5 dB total connection and splice loss. For example, this allocation supports 2 connections with an average insertion loss per connection of 0.75 dB. Connections with different loss characteristics may be used provided the requirements of Table 86–17 and Table 86–18 are met.

Proposed Response
Response Status: O
Proposed Response

Add text to end of paragraph:

'... valid 40GBASE-R signal, or test pattern referenced in Table 87-10.'

similar remedy for 88.8.2

Response Status O

Proposed Response

Add wording extracted from Editors note (p234 line 42ff), and reference to G959.1:

The optical filter passband ripple shall be limited to 0.5 dB and the isolation is chosen such that the ratio of the power in the lane being measured to the sum of the powers of all of the other lanes is greater than 20 dB (See G959.1 Annex B).

and remove Editors note

Proposed Response

Response Status O
NOTE has unnecessary TBD, this is a general statement about test patterns used for testing optical parameters

also applies to 88.8.2

Suggested Remedy
New text for Note

NOTE- Although test patterns are designed to emulate system operation, they do not form valid 40GBASE-R signals.

Proposed Response

Comment Type TR
Table 86-6
Eye mask coordinates: X1,X2,Y1,Y2 and conditions contain TBDs.

Use SFP+MSA mask and coordinates for TP1

Suggested Remedy
Use SFP+MSA mask and coordinates for TP1

Eye mask coordinates: X1,X2,Y1,Y2 become 0.12, 0.33, 95, 350
Condition becomes <5e-5 hit rate.

Proposed Response

Comment Type TR
Table 86-7
Eye mask coordinates: X1,X2,Y1,Y2 and conditions contain TBDs.

Use SFP+MSA mask and coordinates for TP1

Suggested Remedy
Use SFP+MSA mask and coordinates for TP1

Eye mask coordinates: X1,X2,Y1,Y2 become 0.12, 0.33, 95, 350
Condition becomes <5e-5 hit rate.

Proposed Response

Comment Type T
There is a proposal for Table 86-8 to use the Tx eye mask as the aggregate test. If accepted subclause 86.7.4.6 can be deleted.

Suggested Remedy
If proposal for Table 86-8 to use the Tx eye mask as the aggregate test is accepted, delete subclause 86.7.4.6.

Proposed Response

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

Page 73 of 123  10/31/2008  1:24:18 PM
**Comment Type** E  
**Comment Status** X  
The phrase, the four or ten, is introduced and used in several places. Previously, page 199, line 30, the term, n + 1, is used and is more succinct.

**Suggested Remedy**  
Except for page 199, replace all instances of the phrase, the four or ten, with n + 1.

**Proposed Response**  
Response Status O

---

**Comment Type** T  
**Comment Status** X  
The attribute skew is not defined nor does there appear a defined measurement. While this may not be essential in the logical domain, where dynamic skew is being considered and the signals are electrical or optical it appears important to define skew such that jitter is not included.

**Suggested Remedy**  
Add a skew measurement sub-clause to clause 86.7 such that jitter is not captured in the skew measurement.

**Proposed Response**  
Response Status O

---

**Comment Type** T  
**Comment Status** X  
In Table 86-7 the min entry for Total Jitter tolerance at TP1a has a value of 0.3. This has insufficient precision for jitter since it permits a range of 0.25 to 0.349. All jitter entries should have, at least, two significant digits.

**Suggested Remedy**  
In Table 86-7, change the min entry for Total Jitter tolerance at TP1a from 0.3 to 0.30.

**Proposed Response**  
Response Status O

---

**Comment Type** T  
**Comment Status** X  
Including the phrase, "power in OMA" in the sentence, "A signal with power in OMA and average power not within the ranges given cannot be compliant." is not applicable if OMA is deleted from Table 86-8 or is changed to informative.

**Suggested Remedy**  
Change the sentence, A signal with power in OMA and average power not within the ranges given cannot be compliant, to, A signal with average power not within the ranges given cannot be compliant.

**Proposed Response**  
Response Status O

---

**Comment Type** T  
**Comment Status** X  
In Table 86-9, the characteristic, "Optical Modulation Amplitude (OMA), each lane", is not applicable if OMA is deleted from Table 86-8 or is changed to informative.

**Suggested Remedy**  
In Table 86-9, delete the characteristic, "Optical Modulation Amplitude (OMA), each lane", if OMA is deleted from Table 86-8 or is changed to informative.

**Proposed Response**  
Response Status O
Cl 86 SC 86.6.4 P 210 L  # 398

Pettrilla, John
Avago Technologies

Comment Type T Comment Status X

In Table 86-10 Value entries for "Damage threshold" and "Average power at receiver input" show only a single significant digit and lack sufficient precision.

Suggested Remedy
In Table 86-10 change Values entries for "Damage threshold" and "Average power at receiver input" to show at least two significant digits as needed for the desired precision.

Proposed Response  Response Status O

Cl 86 SC 86.7.4.3 P 215 L 28  # 399

Pettrilla, John
Avago Technologies

Comment Type T Comment Status X

There is a proposal for Table 86-8 to replace OMA with an aggregate test. If accepted subclause 86.7.4.3 can be deleted or labeled as informative.

Suggested Remedy
If the proposal for Table 86-8 to replace OMA with an aggregate test is accepted, deleted or labeled subclause 86.7.4.3 as informative.

Proposed Response  Response Status O

Cl 86 SC 86.7.7.4 P 215 L 32  # 400

Pettrilla, John
Avago Technologies

Comment Type T Comment Status X

There is a proposal for Table 86-8 to use the Tx eye mask as the aggregate test. If accepted subclause 86.7.4.3 can be deleted.

Suggested Remedy
If proposal for Table 86-8 to use the Tx eye mask as the aggregate test is accepted, delete subclause 86.7.4.3.

Proposed Response  Response Status O

Cl 86 SC 86.6.1 P 208 L  # 402

Pettrilla, John
Avago Technologies

Comment Type TR Comment Status X

In Table 86-6, has blank entries for TP1a Deterministic Jitter output and units of UI. There are several other instances of units for TJ and DJ shown as UI.

Suggested Remedy
For Table 86-6, TP1a Deterministic Jitter output, enter 0.15 in the Max column and change the Units column entry to UI pk-pk. Check other TJ and DJ entries in Tables 86-6, 7, 11 & 12 and, where appropriate, change UI to UI pk-pk.

Proposed Response  Response Status O

Cl 86 SC 86.6.1 P 208 L 14  # 403

Pettrilla, John
Avago Technologies

Comment Type TR Comment Status X

In Table 86-6, there's a TBD for eye mask coordinate X2 and another in the Conditions column.

Suggested Remedy
In Table 86-6, replace the TBD for eye mask coordinate X2 with 0.25 and delete the TBD in the Conditions column or replace it with a reference to subclause 86.7.4.7.

Proposed Response  Response Status O
Comment Type TR  Comment Status X
In Table 86-7 there's a TBD for Eye mask coordinate X2 and another in the Conditions column.

Suggested Remedy
In Table 86-7, replace the TBD for eye mask coordinate X2 with 0.25 and delete the TBD in the Conditions column or replace it with a reference to subclause 86.7.4.7.

Proposed Response Response Status O

Comment Type TR  Comment Status X
In Table 86-8, the characteristics, Optical Modulation Amplitude (OMA), Optical Modulation Amplitude (OMA), Aggregate signal parameter, and RIN12OMA can be replaced by using the Transmitter eye mask as the aggregate signal parameter.

Suggested Remedy
In Table 86-8, delete or label as informative the characteristics, Optical Modulation Amplitude (OMA), Aggregate signal parameter, and RIN12OMA and use the Transmitter eye mask as the aggregate signal parameter.

Proposed Response Response Status O

Comment Type TR  Comment Status X
In Table 86-10, Value column entries are TBD for attributes, Stressed receiver sensitivity in OMA, Vertical eye closure penalty, and Stressed eye jitter J.

Suggested Remedy
In Table 86-10, change Value column TBD for Stressed receiver sensitivity in OMA to -5.4, Vertical eye closure penalty to 1.67, and Stressed eye jitter J to 0.37.

Proposed Response Response Status O

Comment Type TR  Comment Status X
In Table 86-11, there's a TBD for Eye mask coordinate X2 and another in the Conditions column.

Suggested Remedy
In Table 86-11, change the TBD for Eye mask coordinate X2 from TBD to 0.50 and either delete the TBD in the Conditions column or change to reference subclause 86.7.4.7.

Proposed Response Response Status O
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**Proposed Response**

- **Comment ID # 409**
  - **Comment Type**: TR
  - **Comment Status**: X
  - In Table 86-12, there's a TBD for Eye mask coordinate X2 and another in the Conditions column.
  - **Suggested Remedy**: In Table 86-12, change the TBD for Eye mask coordinate X2 from TBD to 0.50 and either delete the TBD in the Conditions column or change to reference subclause 86.7.4.7.

- **Comment ID # 410**
  - **Comment Type**: TR
  - **Comment Status**: X
  - In Table 86-13 there's a TBD for Allocation for penalties.
  - **Suggested Remedy**: In Table 86-13 change the TBD for Allocation for penalties to 6.8.

- **Comment ID # 411**
  - **Comment Type**: E
  - **Comment Status**: X
  - Typo change: repetition of lanes lines, delete "lanes"
  - **Suggested Remedy**: per comment

- **Comment ID # 412**
  - **Comment Type**: E
  - **Comment Status**: X
  - Typo: change to "at least"
  - **Suggested Remedy**: per comment

- **Comment ID # 413**
  - **Comment Type**: E
  - **Comment Status**: X
  - instead of usec, use the "micro" symbol for microsecond. See page 10 for symbols used in document.
  - **Suggested Remedy**: Per comment

- **Comment ID # 414**
  - **Comment Type**: E
  - **Comment Status**: X
  - Typo change: "PMA is in"
  - **Suggested Remedy**: per comment
**Comment ID # 415**

**CI 83**  
**SC 83.5**  
**P 152**  
**L 14**  
**# 415**  
Ganga, Ilango Intel

**Comment Type**: E  
**Comment Status**: X  
- typo, change to "specified"
- line 23, typo change to "adjacent"

**Suggested Remedy**  
per comment

**Proposed Response**  
Response Status: O

---

**Comment ID # 416**

**CI 83**  
**SC 83.6.2**  
**P 153**  
**L 3**  
**# 416**  
Ganga, Ilango Intel

**Comment Type**: E  
**Comment Status**: X  
- to be consistent change to R x (v/m)
- also on line 8, change to R x (v/n)

**Suggested Remedy**  
per comment

**Proposed Response**  
Response Status: O

---

**Comment ID # 417**

**CI 00**  
**SC 0**  
**P 4**  
**L 29**  
**# 417**  
Ganga, Ilango Intel

**Comment Type**: ER  
**Comment Status**: X  
- IEEE 802.3az: Replace Clause xx with appropriate clause/annex number used by EEE.

**Suggested Remedy**  
Replace with "This amendment includes changes to IEEE Std 802.3–2008 and adds Clause 78."

**Proposed Response**  
Response Status: O

---

**Comment ID # 418**

**CI 80**  
**SC 80.3**  
**P 89**  
**L 25**  
**# 418**  
Ganga, Ilango Intel

**Comment Type**: ER  
**Comment Status**: X  
- typo change to "adjascent"

**Suggested Remedy**  
per comment

**Proposed Response**  
Response Status: O

---

**Comment ID # 419**

**CI 85**  
**SC 85.7.1**  
**P 177**  
**L 10**  
**# 419**  
Ganga, Ilango Intel

**Comment Type**: E  
**Comment Status**: X  
- double period (..). delete a period
- Line 14, typo: change to "transmitter"

**Suggested Remedy**  

**Proposed Response**  
Response Status: O

---

**Comment ID # 420**

**CI 85**  
**SC 85.10**  
**P 191**  
**L 17**  
**# 420**  
Ganga, Ilango Intel

**Comment Type**: E  
**Comment Status**: X  
- line 17: typo, change to "differential"
- line 24: typo, change to "transmitter"

**Suggested Remedy**  

**Proposed Response**  
Response Status: O

---

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

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

**Sort Order:** Comment ID

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Comment Type: E  Comment Status: X

It's not really a "regular 66-bit block" since it doesn't use a defined 64B/64B code.

Suggested Remedy
- Change "regular 66-bit block" to "specially defined 66-bit block"

Proposed Response  Response Status: O

---

Comment Type: E  Comment Status: X

"that looks random and has lots or transitions"

Apart from the obvious typo, this phrase does not seem right - what does it mean to "look random?"

Suggested Remedy
- Change "that looks random and has lots or transitions" to "that is defined to be balanced and irregular with many transitions"

Proposed Response  Response Status: O

---

Comment Type: E  Comment Status: X

"parallel" is not a good word - especially when it is followed by "serial"

Suggested Remedy
- Replace "parallel" with "separate"

Proposed Response  Response Status: O

---

Comment Type: E  Comment Status: X

"sends 4 bits at a time" implies that the bits are sent as a vector.

Suggested Remedy
- Change:
  - it sends 4 bits (for 40GBASE-R) or 20 bits (for 100GBASE-R) of test pattern at a time to
  - it sends the test pattern in 4 separate data streams (for 40GBASE-R) or 20 separate data streams (for 100GBASE-R)

Proposed Response  Response Status: O
The use of "Backplane/Copper/TBD" is particularly ugly. The TF needs to settle on a verbage and stick to it. It doesn't need to be perfect - exceptions and usage changes can always be noted where required.

All of the usage in 802.3ba is BASE-R copper so that usage seems to be the most obvious. There may be some small exceptions for non BASE-R backplane (I haven't checked all the details) but these can be covered with specific notes. Future BASE-R copper may not use the same registers, but that bridge can be crossed when (if) we reach it.

Suggested Remedy
Change "Backplane/Copper/TBD" to "BASE-R copper"

Table 45-3 and all related 45.2.1 register definitions.

The footnote below Table 45-3 can be retained (with the name change). The verbage at the beginning of each register definition should mimic the footnote.

Remove the editor's note.

Proposed Response
Response Status O
Cl 74  SC 74.8  P 81  L 11  # [443]
Barrass, Hugh  Cisco

Comment Type  T  Comment Status  X
All of the register names need to change to match Clause 45.

Suggested Remedy
Change the register names for all the registers in Table 74-1 to match Clause 45 (may be changed by another comment).

Proposed Response  Response Status  O

Cl 82  SC 82  P 112  L 1  # [444]
Barrass, Hugh  Cisco

Comment Type  T  Comment Status  X
This clause reproduces most of Clause 49 without any reference to that clause. There are a number of reasons why this is a bad idea.

Firstly, it allows the definition of the 64B/66B PCS to diverge more than necessary for the development of 40 & 100G. This may cause problems, especially with developers who are planning to reuse parts of their 10GBASE-R designs for 40G or 100G. Subtle differences between the clauses will not easily be noticed. This may be particularly difficult for developers of multi-rate implementations (e.g. 4 x 10G that also supports 40G - or other combination silicon development).

It also wastes time reviewing and commenting on pages of specification that are already in the standard. Not to mention that LOAs may have to be resubmitted for IP that is already in Clause 49.

Suggested Remedy
Rewrite the clause so that copied text is referenced and only the changes and additions are included in this clause.

The commenter will supply complete text if required (based on the existing Clauses 49 and 82).

Proposed Response  Response Status  O

Cl 82  SC 82.2.9  P 126  L 42  # [445]
Barrass, Hugh  Cisco

Comment Type  T  Comment Status  X
The phrase "sends four bits of transmit data at a time" implies that the PCS is sending a 4 bit vector. This is not the case, it is sending 4 data streams.

Also, is there a reason why "four" is spelt out and "20" is not?

Suggested Remedy
Change "sends four bits of transmit data at a time" to "sends four data streams"
Also change "sends 20 bits of transmit data at a time" to "sends twenty data streams"

Proposed Response  Response Status  O

Cl 82  SC 82.2.10  P 128  L 1  # [446]
Barrass, Hugh  Cisco

Comment Type  T  Comment Status  X
The Test-pattern generators description is incomplete - when compared to the source in Clause 49.

It does not describe how the seed is placed in the scrambler, inverted etc.

Suggested Remedy
The full text of 49.2.8 needs to be copied in, then the references to the square wave and PRBS sequences removed.

Proposed Response  Response Status  O
IBTA has selected the CXP connector currently specified as Version 0.3 - Oct. 2, 2008 *120 Gb/s 12x Small Form-factor Pluggable (CXP) Interface Specification for Cables, Active Cables, & Transceivers*. Replace SFF-8092 with the IBTA selected connector SFF-8642 which has been the stated intent (diminico_02_0708.pdf).

**Proposed Response**

Page 195 line 6 replace SFF-8092 with SFF-8642.

---

The maximum insertion loss (in dB with f in MHz) for the transmitter and receiver differential controlled impedance printed circuit boards for each differential lane shall be:

\[
\text{Insertion Loss}(f) = (0.2032)\log(e) \times (2.00E-05\sqrt{f} + 1.1E-10\times f + 3.2E-20\times f^2 + 1.2E-30\times f^3) \text{ TBD dB}
\]

for all frequencies from 100 MHz to 6000 MHz.

Insertion Loss(f) represents 8 inches (0.2032 m) of the maximum fitted attenuation (Amax) due to trace skin effect and dielectric properties as defined in Annex 69B.4.2.
Comment Type: TR/technical required
Comment Status: X
Comment: Add text for inclusion of TP0 and TP5 in subclause 85.7.1.

Suggested Remedy:
- Delete text: The 40GBASE-CR4 and 100GBASE-CR10 channel is defined between the transmitter and receiver blocks to include the transmitter and receiver differential controlled impedance printed circuit board insertion loss and the cable assembly insertion loss as illustrated in Figure 85–2.
- Add text: The 40GBASE-CR4 and 100GBASE-CR10 channel is defined between the transmitter (TP0) and receiver blocks (TP5) to include the transmitter and receiver differential controlled impedance printed circuit board insertion loss and the cable assembly insertion loss as illustrated in Figure 85–2. TP0 and TP5 are reference points that may not be testable in an implemented system.

Proposed Response: Open

Comment Type: TR/technical required
Comment Status: X
Comment: Add channel subclause before cable assembly subclause and move 85.10 (Tx_pcb and Rx_pcb IL) under channel subclause to provide hierarchical structure to specification consistent with channel/link topology.

Suggested Remedy:
1. Add channel subclause before cable assembly subclause- Page 183, Line 49;
   >>85.x Channel
   The 40GBASE-CR4 and 100GBASE-CR10 channel is defined between the transmitter and receiver blocks to include the transmitter and receiver differential controlled impedance printed circuit board insertion loss and the cable assembly insertion loss as illustrated in Figure 85–2.
2. Delete page 191, line 16-34 and move deleted text as new subclause under new channel subclause 85.x

Proposed Response: Open
### Comment ID # 454

**Comment Type:** TR

**Comment Status:** X

**Proposed Response:**

- Add text line 31 page 188>> Since four lanes or ten lanes are used to transfer data between PMDs, the FEXT that is coupled into a data carrying lane will be from the three other lanes or nine other lanes in the same direction.

**SuggestedRemedy**

1. Delete lines 30-54 page 188.
2. Delete lines 1-5 page 189.
3. Add text below new subclause: The combined multi-disturber FEXT and multi-disturber NEXT, specified as the power sum of MDFEXT and MDNEXT, is determined using Equation (85-XX).

**Proposed Response**

**Response Status:** O

### Comment ID # 455

**Comment Type:** TR

**Comment Status:** X

**Proposed Response**

**Response Status:** O

### Comment ID # 456

**Comment Type:** TR

**Comment Status:** X

**Proposed Response**

**Response Status:** O
Add cable assembly ILD specifications to limit cable assembly ILD. Add TBD to equation as contributions from IL and power sum crosstalk to ICR under consideration.

**Suggested Remedy**

Add subclause page 185 line 50 85.9.x Cable assembly insertion loss deviation.

The cable assembly insertion loss deviation is the difference between the cable insertion loss and the fitted insertion loss determined using Equation (85-x).

\[
ILD(f) = IL(f) - IL_{fitted}(f) \quad (85-x)
\]

The fitted insertion loss is determined using Equations (85.xx)-(85.xx): use 69B-1 to 69B-5 for (85.xx)-(85.xx) replacing A(f) with IL_{fitted}(f). Add TBDs beside equations to indicate that an alternate to the least mean square line fit to the cable assembly IL is under consideration.

The ILD shall be within the region bounded by the following equations:

\[
ILD_{max} = 0.7(TBD) + 0.2(TBD) \times 10^{-9} \times (f \times 10^6) \quad TBD \text{ dB}
\]

\[
ILD_{min} = -0.7(TBD) + 0.2(TBD) \times 10^{-9} \times (f \times 10^6) \quad TBD \text{ dB}
\]

1000 MHz ≤ f ≤ 6000 MHz

**Proposed Response**

Add TBD to equation as contributions from IL and power sum crosstalk to ICR under consideration.

The ILD shall be within the region bounded by the following equations:

\[
ILD_{max} = 0.7(TBD) + 0.2(TBD) \times 10^{-9} \times (f \times 10^6) \quad TBD \text{ dB}
\]

\[
ILD_{min} = -0.7(TBD) + 0.2(TBD) \times 10^{-9} \times (f \times 10^6) \quad TBD \text{ dB}
\]

1000 MHz ≤ f ≤ 6000 MHz

**Proposed Response**

Provide values for TBDs in cable assembly insertion loss (85-1) for \(\sqrt{f}\) and f. Remove \(1/\sqrt{f}\) term. Add TBD cable assembly insertion loss equation as contributions from IL and power sum crosstalk to ICR are still under consideration.

**Suggested Remedy**

Replace TBDs with values in (85-1) Add TBD to equation as contributions from IL and power sum crosstalk to ICR are still under consideration.

**Proposed Response**

Insertion Loss (f) = 0.192749*\(\sqrt{f}\)+0.001494*f TBD dB

Remove \(1/\sqrt{f}\) term. Given the CR4 and CR10 bandwidth compared to CX4 the \(1/\sqrt{f}\) loss function term is not necessary as a regression term.

**Proposed Response**

Provide TBD values for 85.9.3 Cable assembly return loss.

**Suggested Remedy**

85.9.3 Cable assembly return loss.

The return loss (in dB with f in MHz) of each pair of the 40GBASE-CR4 and 100GBASE-CR10 cable assembly shall be:

\[
\text{Return}_{loss}(f) = 10 \text{ dB}
\]

for 100 MHz ≤ f < 4000 MHz

\[
\text{Return}_{loss}(f) = 10 - 10 \log_10(f/4000)
\]

for 4000 MHz ≤ f ≤ 10000 MHz

Figure 85–5—Minimum cable assembly return loss (informative) to be provided in attachment.
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Type</th>
<th>Comment Status</th>
<th>Proposed Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>460</td>
<td>E</td>
<td>X</td>
<td>typo: &quot;differential&quot; is misspelled as &quot;diferential&quot; in 85.10 section heading. Change &quot;diferential&quot; to &quot;differential&quot;</td>
</tr>
<tr>
<td>461</td>
<td>E</td>
<td>X</td>
<td>Table 74-1 register names are &quot;Backplane&quot; but they are named &quot;Backplane/Copper/TBD&quot; in Clause 45. This is just a reminder that resolving the naming issue in C45 also applies to Table 74-1. Apply resolution of Table 45-3 &quot;Backplane/Copper/TBD&quot; naming issue to Table 74-1.</td>
</tr>
<tr>
<td>462</td>
<td>T</td>
<td>X</td>
<td>There is unnecessary distinction between CR4 and KR4 in autonegotiation. In Table 45-3 (PMA/PMD registers) we have already set the precedent that backplane and copper registers should be kept common as much as feasible. We should continue this practice. Propose combining KR4 and CR4 Technology Ability fields, priority resolution, and state variables as indicated in Remedy. Beyond simplicity there is a problem with advertising CR4 &amp; KR4 in separate bits and allowing them both to be set. In this case the the underlying PHY cannot distinguish if the media is backplane or copper. The Priority Resolution Table says to pick CR4, but the media may actually be a backplane, so the result would be to indicate a CR4 resolution when it is actually KR4... and it doesn't matter. Combine the bits.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Type</th>
<th>Comment Status</th>
<th>Proposed Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>463</td>
<td>T</td>
<td>X</td>
<td>Table 74-1: Rename bit A3 &quot;40GBASE-KR4/CR4&quot; Reclaim the remaining bits by naming A4 as CR10 &amp; returning A5 to reserved. Table 73-2: Combine CR4 and KR4 into the same resolution priority level. subclause 73.10.1: 40GKR4 and 40GCR4 into the same variable. Either pick one of the two existing variable names, or make a combined name like &quot;40GCK4R4&quot;. Change the description to &quot;represents that the 40GBASE-KR4 or 40GBASE-CR4 PMA is the signal source&quot; subclause 73.10.1: definition of single_link_ready: combine CR4 &amp; KR4 (5 &amp; 6) into one line: &quot;5) link_status_[40GCKR4] = OK&quot; as appropriate for the variable name used above. Table 45-142 (and subclause 45.2.7.12.2): combine autoneg resolution for CR4 and KR4 into the same bit, since autoneg cannot distinguish. Suggest using bit 5. Change the bit 5 description to read &quot;...is negotiated to perform 40GBASE-KR4 or 40GBASE-CR4&quot; (The name for this bit can be resolved in the future to be consistent with the &quot;Backplane/Copper/TBD&quot; names that need to be resolved elsewhere in the draft.)</td>
</tr>
</tbody>
</table>

**NOTE:**

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

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10/31/2008 1:24:19 PM
Comment Type: T  Comment Status: X

Cl 73  SC 73.7.4.1  P75  L 17  # 463
Chalupsy, David  Intel Corp.

Unnecessary distinction between CX4 and KX4 in autonegotiation variables.
Subclause 74.7.4.1 line 17-18 already indicate that CX4 may be parallel detected, and
that it is up to the system implementer to distinguish KX4 form CX4 as the PHY cannot.
To be consistent with that we should remove CX4 state variables from autoneg, because
the PHY cannot distinguish parallel detected KX4 from CX4.

Suggested Remedy
73.7.4.1, line 17. After sentence "Additionally, parallel detection may be used for
10GBASE-CX4" insert "Parallel detection of 10GBASE-CX4 should be indicated by setting
the Negotiated Port Type to 10GBASE-KX4 in the management register 7.48.2."

subclause 73.10.1, page 76 line 8: delete the variable definition 10GCX4.
Page 76, line 37: delete line with "link_status_[10GCX4]=OK"

Proposed Response  Response Status: O

Comment Type: T  Comment Status: X

Cl 80  SC 80.1.1  P85  L 15  # 465
Dudek, Mike  JDSU

Comment Type: E  Comment Status: X

Cl 80  SC 80.1.4  P87  L 18  # 466
Dudek, Mike  JDSU

Comment Type: T  Comment Status: X

Cl 83  SC 83.1.4  P146  L 1  # 467
Dudek, Mike  JDSU

Comment Type: T  Comment Status: X

Proposed Response  Response Status: O

Proposed Response  Response Status: O

Proposed Response  Response Status: O
### Comment 83

**Comment ID**: 468  
**Author**: Dudek, Mike  
**Task Force**: JDSU  
**Comment Type**: T  
**Comment Status**: X  
**Suggested Remedy**: It would be highly desirable to include the prbs9 function as suggested in the TBD note.  
**Proposed Response**: Add the PRBS9 test pattern.

### Comment 84

**Comment ID**: 469  
**Author**: Dudek, Mike  
**Task Force**: JDSU  
**Comment Type**: T  
**Comment Status**: X  
**Suggested Remedy**: I agree that 8ones followed by 8 zeros is a good choice.  
**Proposed Response**: Implement the 8one 8 zero and remove the TBD's.

### Comment 85

**Comment ID**: 470  
**Author**: Dudek, Mike  
**Task Force**: JDSU  
**Comment Type**: T  
**Comment Status**: X  
**Suggested Remedy**: There is likely to be more crosstalk in a KR4 system than in a KR system.  
**Proposed Response**: Evaluate the effects of additional crosstalk and include them in changed specs. In the meantime add an editors note saying "Editors note to be removed prior to publication. The effect of additional crosstalk in the KR4 system is under investigation."

### Comment 86

**Comment ID**: 471  
**Author**: Dudek, Mike  
**Task Force**: JDSU  
**Comment Type**: T  
**Comment Status**: X  
**Suggested Remedy**: Either label the 83A row as XLAUI/CAUI or insert an additional row for CAUI and make the appropriate changes.  
**Proposed Response**: Change "(Style 1) and 85.11.1.2 (Style 2)" to "(Style 1) or 85.11.1.2 (Style 2)".

---

**Type**: TR/technical required  
**Comment Status**: D/dispatched  
**Response Status**: O/open  
**Sort Order**: Comment ID  

---

Page 90 of 123  
10/31/2008 1:24:20 PM
Although there are no requirements on the physical location of the various lanes within the group of lanes there is a requirement for knowing which fibers in the MTP are used for Tx, which are used for Rx and which are not used.

Suggested Remedy

- insert the word "electrical" so that the sentence becomes ".... where the electrical lanes are physically....."
- insert two subsections.
  *86.5.1 Optical lane assignments for 40GBASE-SR4
  Although the location of lanes within the group of Tx lanes is not required, it is necessary to define the positions of the Tx lanes and Rx lanes within the ribbon fiber connector. Figure xxx shows the location.
  86.5.2 Optical lane assignments for 100GBASE-SR10
  Although the location of lanes within the group of Tx lanes is not required, it is necessary to define the positions of the Tx lanes and Rx lanes within the ribbon fiber connector. Figure yyy shows the location.

Figure xxx to be as in INF-8438i figure 20 with the following changes. Title becomes 40GBASE-SR MDI optical receptacle and channel orientations. Replace the row saying Fiber number with "Fiber positions xxxxxxxxxx (12 x's). Replace the numbers in the Transmit and receive Channel rows with xxxx. Add an additional row with "Unused positions" and place XXXX in the middle 4 positions.

Figure yyy to say "TBD. Editors note to be removed prior to publication The figure will show the fibers at the edge of a 12 fiber ribbon as unused positions (ie fiber numbers 1 and 12 are unused.)"

Proposed Response

- Add rows to Table 86-6 after AC common mode.
  "Differential output reflection coefficient, SDD22 Max see 86.6.1.1
  Differential Output common mode reflection coefficient, SCC22 Max -6dB 10MHz to 2.5GHz, -3dB 2.5GHz to 11.1GHz"
  Change title and text of 86.6.1.1 to say "SDD11 at TP1 and SDD22 at TP1a" (ie 2 places)

Proposed Response

- It would be good to label Table 86-6 with "at TP1a" at the end of the title.

Proposed Response
Optical receivers are in general limited by the peak power of the input signal (Average power is less important). As the spec stands the receiver has to cope with the maximum input average power at infinite extinction ratio with the allowed eye mask overshoot. This is much more than is likely to happen in practice. We should limit the peak power explicitly.

Suggested Remedy

Add extra rows to Tables 86-8, 86-9, 86-10.

Peak Power Max 3dBm. (no min)

To this row in table 86-8 add a footnote. Peak Power is the maximum value of the power as measured on the eye diagram see 86.7.4.7

Proposed Response

Response Status  O

In order to ensure that reflections don't overly degrade performance, the differential return loss of the host needs to be specified. To control EMI the differential to common mode reflection coefficient of the host also needs to be specified.

Suggested Remedy

Add rows to Table 86-12 after Deterministic jitter tolerance

"Differential input reflection coefficient, SDD11 Max see 86.6.5.1

Reflected Differential to common mode conversion, SCD11 Max -10dB 10MHz - 11.1GHz

Change title and text of 86.6.5.1 to say "SDD22 at TP4 and SDD11 at TP4a" (ie 2 places)

Proposed Response

Response Status  O

For consistency and to ensure reproducible measurements the square test pattern with a fixed number of ones and zeros should be used for the measurements of OMA, and RIN.

The budgeting for the link assumes that the difference between the OMA for the Tx and the OMA for the Rx is the optical loss (average power). If the prbs9 is used to measure OMA for the Tx while square wave is used for the Rx this may no longer be true as the prbs9 pattern and square wave pattern will not always give the same answer. (If a vendor wishes to use prbs9 for production test the vendor should guard band his measurements for the differences the guard band being based on his own product characteristics.)

Suggested Remedy

Make the measurements of OMA and RIN patterns Square eight ones and eight zeros for all three rows in standard font. Remove the editor preference note. Change the footnote to say "The items in italics" instead of "The second column"

Proposed Response

Response Status  O
Cl 86 SC 86.7.3.1 P 215 L 3 # 482
Dudek, Mike JDSU
Comment Type T Comment Status X
Missing definition of AC common mode voltage
SuggestedRemedy
Copy the section from SFF8431 D.15 with editorial changes to remove SFP+ references.
Proposed Response

Cl 86 SC 86.7.3.2 P 215 L 8 # 483
Dudek, Mike JDSU
Comment Type TR Comment Status X
Missing Test procedure for Termination mismatch.
SuggestedRemedy
Copy the section from SFF8431 D.16
Proposed Response

Cl 86 SC 86.7.4.1 P 215 L 20 # 484
Dudek, Mike JDSU
Comment Type T Comment Status X
It is bad practice to specify things in two places.
SuggestedRemedy
Delete the test pattern description "appropriate portion........to end of sentence" and replace with "pattern defined in Table 86-15.
Do the equivalent at line 39.
Proposed Response

Cl 86 SC 86.7.4.6 P 215 L 45 # 485
Dudek, Mike JDSU
Comment Type TR Comment Status X
We need to say what test pattern is on the channels not under test
SuggestedRemedy
Add the sentence. "The pattern on the lanes not under test should be prbs31 or valid 40GBASE-R encoded data."
Proposed Response

Cl 86 SC 86.10.2.1 P 219 L 29 # 486
Dudek, Mike JDSU
Comment Type TR Comment Status X
I understand that the chromatic specifications for OM3 fiber are now tighter than listed here.
SuggestedRemedy
Change the max value of the zero disperions wavelength from 1320nm to 1316nm.
Change the Chromatic dispersion slope max line to 0.1028 for 1300<=lambda <= 1316 and .........
Proposed Response

Cl 87 SC 87.6.1 P 231 L 30 # 487
Dudek, Mike JDSU
Comment Type T Comment Status X
With a specification for the receiver reflection of -26dB there is no need to require the Transmitter to tolerate a 12dB reflection. The cable is limited to 26dB return loss at any discrete reflection. A tolerance to 20dB reflection would appear adequate.
SuggestedRemedy
Change optical return loss tolerance from 12db to 20db on line 30. Change RIN12 to RIN20 on line 28. Change RIN12 to RIN20 in 87.7.7 page 236 line 20 and insert "that the reflection is 20dB and" between "exception" and "that on page 236 line 21, change 12db to 20db for optical return loss in table 87-11 on page 235 line 17, and change from TBD to 21 for the optical return loss in table 87-13 page 239 line 17.
Proposed Response
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Cl</th>
<th>SC</th>
<th>Page</th>
<th>Line</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>488</td>
<td>87</td>
<td>SC 87.6.1</td>
<td>231</td>
<td>13</td>
<td>Optical receivers are in general limited by the peak power of the input signal (Average power is less important). As the spec stands the receiver has to cope with the maximum input average power at infinite extinction ratio with the allowed eye mask overshoot. This is much more than is likely to happen in practice. We should limit the peak power explicitly. (The suggested value equates to the Maximum average power at 9dB ER without overshoot).</td>
</tr>
<tr>
<td>490</td>
<td>87</td>
<td>SC 87.7.2</td>
<td>233</td>
<td>42</td>
<td>Transition time appears to be the same as rise/fall time. If they are the same they should be called the same thing here and in table 83A-1, and 83A.4.4</td>
</tr>
<tr>
<td>491</td>
<td>87</td>
<td>SC 87.6.1</td>
<td>235</td>
<td>4</td>
<td>There are multiple different jitter measurements.</td>
</tr>
<tr>
<td>492</td>
<td>83A</td>
<td>SC 83A.3.3.5</td>
<td>286</td>
<td>18</td>
<td>It is bad practice to specify things in two places.</td>
</tr>
</tbody>
</table>

**Suggested Remedy**

- Add extra rows to Tables 87-7, and 87-8,
- Peak Power Max 4.5dBm. (no min)
- To this row in table 87-7 add a footnote. Peak Power is the maximum value of the power as measured on the eye diagram see 86.7.4.7
- Change "Jitter less than 0.2UI" to "Total Jitter less than 0.2UI".
- Change "transition time" to "rise/fall time" in the title of this subclause and in the first sentence.
- Move the labels X2 and 1-X2 to line up with the dotted lines.

**Comment Status**

- X: Rejected
- O: Open
- W: Written
- C: Closed
- U: Unsatisfied
- Z: Withdrawn

**Response Status**

- O: Open
- C: Closed

**Comment Type**

- TR: Technical Required
- ER: Editorial Required
- GR: General Required
- T: Technical
- E: Editorial
- G: General

**Comment ID**

- 488
- 490
- 491
- 492
- 493
<table>
<thead>
<tr>
<th>Comment ID</th>
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<th>Scoping</th>
<th>Page</th>
<th>Line</th>
<th>Proposed Response</th>
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<tbody>
<tr>
<td>494</td>
<td>T</td>
<td>83A.3.4</td>
<td>286</td>
<td>41</td>
<td>Dudek, Mike JDSU</td>
</tr>
<tr>
<td>494</td>
<td>T</td>
<td>83A.3.4</td>
<td>286</td>
<td>41</td>
<td>Dudek, Mike JDSU</td>
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<td>495</td>
<td>T</td>
<td>83A.3.4</td>
<td>287</td>
<td>52</td>
<td>Dudek, Mike JDSU</td>
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<td>496</td>
<td>T</td>
<td>83A.3.4</td>
<td>288</td>
<td>8</td>
<td>Dudek, Mike JDSU</td>
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<tr>
<td>497</td>
<td>T</td>
<td>83A.3.4</td>
<td>289</td>
<td>40</td>
<td>Dudek, Mike JDSU</td>
</tr>
<tr>
<td>498</td>
<td>TR</td>
<td>87.7.6</td>
<td>236</td>
<td>14</td>
<td>Dudek, Mike JDSU</td>
</tr>
</tbody>
</table>

**Comment Type** | **Comment Status** | **Proposed Response** |
--- | --- | --- |
T | X | Add footnote d to the Rise/fall time row. Footnote d to say "Rise and Fall times are defined in 83A.4.4" |
T | X | Change 50MHz to 10MHz here and in equation 83A-3 (page 288 line 4) |
TR | X | Change the title of the section to "Reflected differential to common mode conversion." |
T | X | Add to the editors note here "This section should include at what probability the eye mask has to be met" |
T | X | Add to the Characteristic Impedance editors note (page 289 line 49) "and return loss specifications" |
T | X | Change "using TBD test pattern or a valid 40GBASE-R signal" with "using the test pattern defined in table 87-10."

**Comment Status** |
--- |
X |

**Response Status** |
--- |
O |

**Suggested Remedy** |
--- |
Add footnote d to the Rise/fall time row. Footnote d to say "Rise and Fall times are defined in 83A.4.4" |
Change 50MHz to 10MHz here and in equation 83A-3 (page 288 line 4) |
Change the title of the section to "Reflected differential to common mode conversion." |
Add to the editors note here "This section should include at what probability the eye mask has to be met" |
Add to the Characteristic Impedance editors note (page 289 line 49) "and return loss specifications" |
Change "using TBD test pattern or a valid 40GBASE-R signal" with "using the test pattern defined in table 87-10."
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>SuggestedRemedy</th>
<th>Proposed Response</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>500</td>
<td>87</td>
<td>239</td>
<td>18</td>
<td>T</td>
<td>X</td>
<td>The channel characteristics for max channel insertion loss, and Positive and negative dispersion are a function of wavelength it would be good to note the wavelength range for which the values in table 87-13 apply.</td>
<td>Add a footnote to Channel insertion loss (max), Positive dispersion (max), and negative dispersion (min). The footnote to say. Over the wavelength range 1264.5nm to 1337.5nm.</td>
<td>O</td>
</tr>
<tr>
<td>501</td>
<td>88</td>
<td>247</td>
<td>26</td>
<td>T</td>
<td>X</td>
<td>With a specification for the receiver reflection of -26dB there is no need to require the Transmitter to tolerate a 12dB reflection. The cable is limited to 26dB return loss at any discrete reflection. A tolerance to 20dB reflection would appear adequate.</td>
<td>Change optical return loss tolerance from 12dB to 20dB on line 32 Table 88-7. Change RIN12 to RIN20 on line 30. Change RIN12 to RIN20 in 87.8.7 page 259 line 16 and insert &quot;that the reflection is xdB&quot; between &quot;exception&quot; and &quot;that&quot; on page 259 line 18. Also change the Optical return loss (min) for LR4 in Table 88-15 to 20dB.</td>
<td>O</td>
</tr>
<tr>
<td>502</td>
<td>88</td>
<td>248</td>
<td>45</td>
<td>T</td>
<td>X</td>
<td>With a specification for the receiver reflection of -26dB there is no need to require the Transmitter to tolerate a 12dB reflection. The cable is limited to 26dB return loss at any discrete reflection. A tolerance to 20dB reflection would appear adequate.</td>
<td>Change optical return loss tolerance from 12dB to 20dB on line 32 Table 88-11. Change RIN12 to RIN20 on line 28. If my comment 35 is not accepted Change RIN12 to RNx in 87.8.7 page 259 line 16 and insert &quot;that the reflection is xdB&quot; and between &quot;exception&quot; and &quot;that&quot; on page 259 line 18. Also add a sentence at the end of this sentence. The value of x is given in the relevant table. Also change the optical return loss (min) for ER4 to 20dB in Table 88-15.</td>
<td>O</td>
</tr>
</tbody>
</table>
### Proposed Response

**Comment Type**: TR/technical required  
**Comment Status**: X

**Comment**

Optical receivers are in general limited by the peak power of the input signal (Average power or OMA is less important). As the spec stands the receiver has to cope with the maximum input average power with the maximum OMA and the allowed eye mask overshoot. This is much more than is likely to happen in practice and is also restricting the maximum OMA at lower average powers. We should limit the peak power explicitly, and relax the maximum OMA value. (The suggested value equates to a maximum OMA of 4.5dBm with a maximum Average power of 4.5dBm, or an ER of 4.7 at 4.5dBm average power).

**Suggested Remedy**

- Add an additional row in tables 88-7, 88-8, with
  - Peak Power Max 6.3dBm. (no min)
  - Increase the Maximum OMA to 5.5dBm.

To the peak power row in table 87-7 add a footnote. Peak Power is the maximum value of the power as measured on the eye diagram see 88.8.8

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

---

### Proposed Response

**Comment Type**: TR/technical required  
**Comment Status**: X

**Comment**

Optical receivers are in general limited by the peak power of the input signal (Average power or OMA is less important). As the spec stands the receiver has to cope with the maximum input average power with the maximum OMA and the allowed eye mask overshoot. This is much more than is likely to happen in practice and is also restricting the maximum OMA at lower average powers. We should limit the peak power explicitly, and relax the maximum OMA value. (The suggested value equates to a maximum OMA of 4.0dBm with a maximum average power of 2.4dBm without overshoot).

**Suggested Remedy**

- Add an additional row in tables 88-11 and 88-12 with
  - Peak Power Max 4.8dBm. (no min)
  - Increase the Maximum OMA to 5.0dBm.

To the peak power row in table 87-11 add a footnote. Peak Power is the maximum value of the power as measured on the eye diagram see 88.8.8

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

---

### Proposed Response

**Comment Type**: E/spelling error  
**Comment Status**: X

**Comment**

There are multiple different jitter measurements.

**Suggested Remedy**

- Change "Jitter less than 0.2UI" to "Total Jitter less than 0.2UI".

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

---

### Proposed Response

**Comment Type**: TR/technical required  
**Comment Status**: X

**Comment**

Optical receivers are in general limited by the peak power of the input signal (Average power or OMA is less important). As the spec stands the receiver has to cope with the maximum input average power with the maximum OMA and the allowed eye mask overshoot. This is much more than is likely to happen in practice and is also restricting the maximum OMA at lower average powers. We should limit the peak power explicitly, and relax the maximum OMA value. (The suggested value equates to a maximum OMA of 4.0dBm with a maximum average power of 2.4dBm without overshoot).

**Suggested Remedy**

- Add an additional row in tables 88-11 and 88-12 with
  - Peak Power Max 4.8dBm. (no min)
  - Increase the Maximum OMA to 5.0dBm.

To the peak power row in table 87-11 add a footnote. Peak Power is the maximum value of the power as measured on the eye diagram see 88.8.8

**Proposed Response**  
**Response Status**: O
Cl 88 SC 88.8.6 P 259 L 11 # 510
Dudek, Mike JDSU

Comment Type T Comment Status X
It is bad practice to specify things in two places.

Suggested Remedy
Change "using aTBD test pattern or a valid 40GBASE-R signal" with "using the test pattern defined in table 88-14."

Proposed Response Response Status O

Cl 88 SC 88.12 P 262 L 21 # 511
Dudek, Mike JDSU

Comment Type T Comment Status X
The channel characteristics for max channel insertion loss, and Positive and negative dispersion are a function of wavelength it would be good to note the wavelength range for which the values in table 87-13 apply.

Suggested Remedy
Add a footnote to Channel insertion loss (max), Positive dispersion (max), and negative dispersion (min). The footnote to say. "Over the wavelength range 1294.53nm to 1310.19nm."

Remove the editors note.

Proposed Response Response Status O

Cl 86 SC 86.10.2.3 P 220 L 6 # 515
Kolesar, Paul CommScope

Comment Type TR Comment Status X
The MPO connector is the form of choice on cabling infrastructure supporting array connectivity. It is also the connector selected in MSAs like the QSFP and SNAP12. Unlike past standardization periods where two-fiber connector forms were hotly debated, the MPO is virtually uncontested in the array connectivity space. This permits straight forward specification of the MPO to terminate the cabling at the MDI. Note that the proposed interface type 7-4 permits from 2 to 24 fibers. It is expected that this may be further defined to be fiber-count specific. This specificity is already possibel in the cans of 40GBASE-SR4 as the 12 fiber type. It may be either 12 or 24 fibers as the MSA for 100GBASE-SR10 is defined.

Suggested Remedy
Add the following:
The connector type terminating the cabling at the MDI shall meet the specifications of IEC 61754-7 interface 7-4 (MPO female plug connector with flat interface).

Proposed Response Response Status O
<table>
<thead>
<tr>
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**Comment Type: T**

**Comment Status: X**

The maximum skew and dynamic skew for the multimode fiber medium are TBDs that require values. The values suggested are calculated using the skew model adopted by the TF in May 2008 found in kolesar_02_0508.xls with the default worst-case parameters at a link length of 300 m to allow for the possibility of extended reach technologies. Engineering the de-skew circuits to handle this amount of skew will permit support for possible future enhancements. Note that the skew value suggested here three times larger than that suggested in another comment submitted against line 46 of page 218 (table 86-17) wherein the channel distance is explicitly defined as a 100 m maximum.

**Suggested Remedy:**

Replace the existing sentence with:

The delays through the medium shall match to within 13.6 ns and do not change by more than 20.3 ns including the effects of varying launch conditions and operating wavelength.

---

**Comment ID: 517**

**Comment Type: T**

Cabling skew value is presently TBD and needs to be defined.

**Suggested Remedy:**

Replace TBD with 4.5. This value is consistent with the worst-case value for a 100 m link as determined using the MM skew model kolesar_02_0508.xls.

---

**Comment ID: 520**

**Comment Type: TR**

The present specification references a fiber specification as if it were a cabling specification. This can be remedied by referencing the cabling specifications for ribbon and multimode cable forms, and also stating that the fiber contained within these cable shall meet the OM3 fiber performance code. The presently referenced cable specs are inappropriate, as the first is for simplex and duplex indoor cable, and the second for premises outdoor cable.

**Suggested Remedy:**

Replace:

- The 40GBASE-SR4 and 100GBASE-SR10 fiber optic cabling shall meet the requirements of IEC 60793-2-10 and the requirements given in Table 86-18, where they differ.
- Multimode cables chosen from [Editor's note (to be removed prior to publication)] - Insert additional reference for multilayer cable if appropriate. IEC 60794-2-11 or IEC 60794-3-12 may be suitable.

With:

- The 40GBASE-SR4 and 100GBASE-SR10 fiber optic cabling shall meet the requirements of IEC 60794-2-21 or IEC 60794-2-31. The fiber contained within these cables shall meet the requirements of IEC 60793-2-10 type A1a.2.

---

**Comment ID: 520**

The dispersion characteristics quoted have been superseded. The third edition of IEC 60793-2-10 published in 2006 adjusted the characteristics to more closely reflect that actual dispersion characteristics of 50μm fibers. Requiring the fiber to meet IEC 60793-2-10 makes repeating the dispersion characteristic in table 86-18 redundant. But if these specs must be repeated, then they should be in harmony with the IEC spec.

**Suggested Remedy:**

Replace the zero dispersion wavelength value with:

$$1295 < \lambda_0 < 1340$$

Replace the dispersion slope value with:

$$< 0.105 \text{ for } 1295 \text{ nm} < \lambda_0 < 1310$$

$$< 0.000375(1590 - \lambda_0) \text{ for } 1310 \text{ nm} < \lambda_0 < 1340 \text{ nm}$$

Note: All the above < symbols should be "less than or equal to" symbols.

---

**Comment ID: 520**

Replace "Method 2" with "Annex A".

---

**Comment ID: 520**

Replace the insertion loss measurement referenced in under revision and has passed CVD ballot and is entering FDIS stage. The methods have been renamed. Method 2 is becoming the method of Annex A.

**Suggested Remedy:**

- Replace the insertion loss measurement referenced in under revision and has passed CVD ballot and is entering FDIS stage.
- The methods have been renamed. Method 2 is becoming the method of Annex A.
<table>
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<tr>
<td>521</td>
<td><strong>Cl 73 SC 10.1</strong>&lt;br&gt;Valliappan, Magesh Broadcom&lt;br&gt;<strong>Comment Type</strong>: TR <strong>Comment Status</strong>: X&lt;br&gt;For KR4/CR4/CR10 implementations where PMD&amp;AN are in one device and the PCS&amp;MAC are in a different device separated by an XLAUI interface, there isn’t a well defined way for autoneg to access link status from the PCS.&lt;br&gt;&lt;br&gt;<strong>Suggested Remedy</strong>: The best remedy is an in-band indication of link status through the XLAUI interface, but I don’t know how this can be done.&lt;br&gt;Will submit a presentation if suitable solution is available.</td>
</tr>
<tr>
<td>522</td>
<td><strong>Cl 45 SC 2.3.20a</strong>&lt;br&gt;Ofelt, David Juniper Networks&lt;br&gt;<strong>Comment Type</strong>: E <strong>Comment Status</strong>: X&lt;br&gt;There are some cut-paste errors.&lt;br&gt;In 20a - there are references to &quot;register 2&quot; that should be &quot;register 4&quot;&lt;br&gt;In 20a.1 - There are references to bit &quot;3.51&quot; that should be &quot;3.53&quot;&lt;br&gt;In table 45-99a - The bit numbers references in the table are listed as &quot;3.50&quot;, they should be &quot;3.53&quot;.&lt;br&gt;All the other sections in 20a.3 reference &quot;3.51&quot; and instead of &quot;3.53&quot;&lt;br&gt;&lt;br&gt;<strong>Suggested Remedy</strong>: Change the references to &quot;register 2&quot; to &quot;register 4&quot;&lt;br&gt;Change the references to &quot;3.51&quot; to &quot;3.53&quot;.</td>
</tr>
</tbody>
</table>
| 523        | **Cl 69 SC 1.3**<br>Ofelt, David Juniper Networks<br>**Comment Type**: E **Comment Status**: X<br>The "I" in the "MDI" label is the wrong font size :).
<br>**Suggested Remedy**: Make it bigger... |
| 524        | **Cl 74 SC 7.4.5**<br>Ofelt, David Juniper Networks<br>**Comment Type**: E **Comment Status**: X<br>Punctuation missing for "In case of sucessful decoding the decoder..."
<br>**Suggested Remedy**: Change to<br>"In case of sucessful decoding, the decoder..."
<br>or possibly<br>"In the case of sucessful decoding, the decoder..."
<br><br>**Proposed Response** **Response Status**: O |
| 525        | **Cl 82 SC 2.4.10**<br>Ofelt, David Juniper Networks<br>**Comment Type**: E **Comment Status**: X<br>Sentence unclear...
<br>"When it is necessary to designate the control character for the sequence ordered_set specifically, /Q/ will be used."
<br>**Suggested Remedy**: Clarify what is meant by needing to specify the control character. |
| 526        | **Cl 77 SC 8.2**<br>Ofelt, David Juniper Networks<br>**Comment Type**: E **Comment Status**: X<br>Number of bytes needed to transmit a frame is not specified.
<br>**Suggested Remedy**: Add number of bytes to be transmitted. |
| 527        | **Cl 78 SC 8.2**<br>Ofelt, David Juniper Networks<br>**Comment Type**: E **Comment Status**: X<br>The "I" in the "MDI" label is the wrong font size :).
<br>**Suggested Remedy**: Make it bigger... |

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

**Comment ID #** 525 **Page 100 of 123** 10/31/2008 1:24:21 PM
### Proposed Response

People sometimes assume that designing in a large skew buffer will add latency. It would be good to add some clarifying text.

**Suggested Remedy**

Add something like:

A design that allows for a large amount of skew tolerance does not add any additional latency. Latency due to skew only occurs due to the differential delay between all paths between the source and destination. The path with the largest latency will end up with the smallest skew buffer.

### Proposed Response

Every variable in the figure is defined except for "v".

**Suggested Remedy**

Add a label to define "v" to the figure.

### Proposed Response

I find the usage of m, n, p, q, and x, y to be inconsistent throughout the text.

p and q seem to always be the the number of links on the RS/FEC facing and PMD sides of a given PMA.

x and y are introduced here "A Tx PMA with x input lanes and y output lanes is paired with an Rx PMA with y input lanes and x output lanes" but then in 83.3.1 and 83.3.2, x is always used as the input lane count and y as the output lane count - this is direction independent.

Then in figure 83-4 and in the text that deals with bits assigned to virtual lanes (e.g. 83.6.2), m and n are used for the input and output lane count and "x" is used for the offset of the current bit.

**Suggested Remedy**

Make the variable usage more consistent. One way would be to have the generic input and output lane counts be "m" and "n" and the direction-specific counts as "p" and "q". x and y can then be reserved for talking about bit positions or any other need for a generic variable.
Cl 82  SC 82.2.21  P 137  L 30  # 530
Ofelt, David  Juniper Networks
Comment Type  T  Comment Status  X
Figure 82-13 - The state diagram is confusing (at least to me) about whether it is intending
to declare alignment lock after 2 or 4 alignment blocks. The state diagram has a back arc
from VALID_AM to TEST_AM if am_cnt < 4, but if am_cnt is two, then it exits to the
2_GOOD state and we declare that we have alignment lock for that lane.

There does not seem to be any text description of the process, so I can't double-check the
intent that way.

Suggested Remedy
If the state diagram is in error (should be am_cnt==4 to get lock), then fix it. Otherwise,
add some descriptive text to 82.2.12 to describe the general algorithm. Actually, adding
descriptive text in either case would be good.

Proposed Response  Response Status  O

Cl 83  SC 6.7  P 155  L 47  # 531
Ofelt, David  Juniper Networks
Comment Type  T  Comment Status  X
Response to the Editor's question about should the BIST logic report errors per lane...

Suggested Remedy
I think that we either need to provide a error counter per lane or there needs to be registers
that capture the lane number of the first lane to see errors and then the error count for that lane.

Proposed Response  Response Status  O

Cl 82  SC 82.2.4.5  P 122  L 12  # 532
Vijayaraghavan, Divya  Altera Corp.
Comment Type  T  Comment Status  X
Block Types 4b and 55 have the same format in the 64b/66b table (figure 82-5). Typo in
block type 55.

Suggested Remedy
Remove block type 55. Does not apply to 8 byte alignment.

Proposed Response  Response Status  O

Cl 45  SC  P 58  L  # 533
Vijayaraghavan, Divya  Altera Corp.
Comment Type  E  Comment Status  X
Page: 58, 63
- Table 45
  - 97a: register value should be 3.51 not 3.50
  - Table 45
  - 99a: register value should be 3.53 not 3.50

Suggested Remedy
Always compare to 2 or 4, but not both.

Proposed Response  Response Status  O

Cl 82  SC Figure 82-13  P 137  L 27  # 534
Vijayaraghavan, Divya  Altera Corp.
Comment Type  T  Comment Status  X
Inconsistency in am_cnt in alignment marker state machine

Suggested Remedy
Always compare to 2 or 4, but not both.

Proposed Response  Response Status  O

Cl 82  SC 82.2.9  P 127  L 5  # 535
Vijayaraghavan, Divya  Altera Corp.
Comment Type  TR  Comment Status  X
Lane 10: 2d and de are not inversions of each other. Which is right and which needs
correction?

Suggested Remedy
Fix incorrect value

Proposed Response  Response Status  O
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**Comment ID 536**: Figure 85-10 and 85-11 Add Figure

**Suggested Remedy**
- Figures to be provided on supporting documents

**Proposed Response**
- Response Status O

**Comment ID 537**: Table 85-7 Add values

**Suggested Remedy**
- Add values from QSFP Specification, to be provided in supporting documentation

**Proposed Response**
- Response Status O

**Comment ID 538**: Figure 85.2 Location of TP-1 and TP-4

**Suggested Remedy**
- Recommend either placing two new test points TP-0 and TP-5 located 4" from connector (per nicholl_01_0708.pdf) or to move TP-1 and TP-4 a specified amount of loss (possibly 2dB @ 5.1625GHz)

**Proposed Response**
- Response Status O

**Comment ID 540**: Figure 85-4 - Provide specific values for cable assembly (TP-1 to TP-4), and for cable assembly including fixturing (TP-0 to TP-5?)

**Suggested Remedy**
- Add values from supporting document

**Proposed Response**
- Response Status O
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<td>Add mating face views from the SFF-8632 (referenced by 8092)</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
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<td>MDIO base on 1.5 V HSTL logic in CL 45 is outdated and often require extra power source.</td>
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<td>167</td>
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<td>X</td>
<td>Learning KR specifications weakness the current interference tolerance test is not comprehensive since there is no group delay or phase info in the channel</td>
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<td>84</td>
<td>167</td>
<td>L</td>
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<td>Loopback channel in 69B has no phase or group delay, this is major weakness when KR specifications are proposed to be used for CR4 and CR10</td>
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<td>There is no definition of TP1 or TP4, Please provide definition for TP1 and TP4</td>
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**Proposed Response**

- **Response Status**: O

**Comment ID # 554**

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

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

**SORT ORDER**: Comment ID
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<td>556</td>
<td>TR</td>
<td>X</td>
<td>Transmitt Compliance Point - Any interconnect may be used between the XLAUI/CAUI transmit function and Transmitt Compliance Point as long as transmitter parameters of Table 83A-1 are met. Receive Compliance Point - The interconnect from the Receive Compliance Point to the XLAUI/CAUI receive function including AC coupling SDD21 response shall be SDD21(dB) &gt;= (-0.007 - 0.1684<em>SQRT(f)) - 0.0617</em>f) f is given in Hz. SDD21 loss a Nyquist is 0.7 dB and 0.2 larger than SFP+ loss.</td>
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<td>Line</td>
<td>Comment</td>
<td>Suggested Remedy</td>
<td>Comment Status</td>
</tr>
<tr>
<td>------------</td>
<td>--------------</td>
<td>-------</td>
<td>------</td>
<td>------</td>
<td>---------</td>
<td>------------------</td>
<td>----------------</td>
</tr>
<tr>
<td>561</td>
<td>TR</td>
<td>9.4.2</td>
<td>187</td>
<td>5</td>
<td>NEXT has high frequency component but the NEXT frequency is limited 6 GHz.</td>
<td>Increase NEXT frequency range to 11 GHz or show there is no impact limiting NEXT to 6 GHz.</td>
<td>X</td>
</tr>
<tr>
<td>562</td>
<td>TR</td>
<td>A.3.2</td>
<td>283</td>
<td>37</td>
<td>PWS (Pulse Width Shrinkage) a critical parameter on transmitter high frequency performance is missing from list of parameters in table 83A-1.</td>
<td>Purpose to add PWS (Pulse Width Shrinkage) with 0.12 UI value. PWS is measured per FC-PI-4 Annex A.1.3.2 using PRBS9 pattern</td>
<td>X</td>
</tr>
<tr>
<td>563</td>
<td>TR</td>
<td>8.3</td>
<td>181</td>
<td>33</td>
<td>With faster processes 24 ps transition time starting to be an issue</td>
<td>Suggest to change 24 ps to 20 ps</td>
<td>X</td>
</tr>
<tr>
<td>564</td>
<td>TR</td>
<td>8.3</td>
<td>181</td>
<td>25</td>
<td>To guarantee interoperability a transmitter compliance test method is required.</td>
<td>Purpose to use software method of IEEE 802.3 CL 68 TWDP which uses cable impulse response.</td>
<td>X</td>
</tr>
<tr>
<td>565</td>
<td>TR</td>
<td>6.1</td>
<td>208</td>
<td>12</td>
<td>The classical DJ and RJ measured jitter are jitter PDF dependent and not valid for jitter distribution which are not dual-dirac.</td>
<td>Replace RJ with UJ of 0.025 UI (RMS) per IEEE CL 68.6.8 method Replace DJ with DDJ of 0.15 UI per method of FC-PI4 A.1.3.1 with PSBS 9 pattern</td>
<td>X</td>
</tr>
<tr>
<td>566</td>
<td>TR</td>
<td>3.3</td>
<td>283</td>
<td>35</td>
<td>The classical DJ and RJ measured jitter are jitter PDF dependent and not valid for jitter distribution which are not dual-dirac.</td>
<td>To limit the uncorrelated jitter add UJ of 0.025 UI (RMS) per IEEE CL 68.6.8 method Replace DJ with DDJ of 0.17 UI per method of FC-PI4 A.1.3.1 with PSBS 9 pattern</td>
<td>X</td>
</tr>
</tbody>
</table>
With faster processes 24 ps transition time starting to be an issue
SuggestedRemedy
  Suggest to change 24 ps to 20 ps
Proposed Response  Response Status  O

Currently table 85-4 only has transmitter off level which is 30 mV and you wouldn't go that far with it!
SuggestedRemedy
  Please add VMA per defintion of IEEE CL 68.6.2 with min value of 360 mV
Proposed Response  Response Status  O

Differential Output return loss is TBD
SuggestedRemedy
  Purpose to use SDD11 per equation 83A-1
Proposed Response  Response Status  O

Differential input return loss is TBD
SuggestedRemedy
  Purpose to use SDD22 per equation 83A-1
Proposed Response  Response Status  O

Max input differential p-p level of of 1200 mV is not compatible with the SR4 and SR10, where both SRxx and CRxx serve the front panel market and some time on the same port!
SuggestedRemedy
  Reduce max input level to 850 mV
Proposed Response  Response Status  O
<table>
<thead>
<tr>
<th>Comment ID #</th>
<th>CI</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Suggested Remedy</th>
<th>Response Status</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>574</td>
<td>85</td>
<td>7.1</td>
<td>177</td>
<td>20</td>
<td>TR</td>
<td>X</td>
<td>802.3ap backplanes support KX, KX4 and KR. CR4/CR10 are based on the 802.3ap and has the full provision to support another IEEE803.3ak (CX4)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Add bitrate of 3.125 GBd to line 22. Duplicate Transition time line for CX4 with min value of 20 ps and max value of 130 ps. Add differential output voltage p-p 800 mV to 1200 mV for CX4</td>
<td>O</td>
<td>Ghiasi, Ali Broadcom</td>
</tr>
<tr>
<td>575</td>
<td>85</td>
<td>8.4</td>
<td>183</td>
<td>21</td>
<td>TR</td>
<td>X</td>
<td>Since CR4/CR10 does not interface with KX there is no reason to have 1600 mV damage threshold</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Remove 1600 mV damage threshold</td>
<td>O</td>
<td>Ghiasi, Ali Broadcom</td>
</tr>
<tr>
<td>576</td>
<td>85</td>
<td>8.4</td>
<td>183</td>
<td>9</td>
<td>TR</td>
<td>X</td>
<td>Support for CX4 is missing from the table. 802.3ap already has support for KX4 operation which is similar to CX4.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Add Signalling rate of 3.125 GBd to table 85-5.</td>
<td>O</td>
<td>Ghiasi, Ali Broadcom</td>
</tr>
<tr>
<td>577</td>
<td>86</td>
<td>9.1</td>
<td>185</td>
<td>16</td>
<td>TR</td>
<td>X</td>
<td>3.125 GBd operation insertion loss missing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Add insertion loss limit from from 54-3.</td>
<td>O</td>
<td>Ghiasi, Ali Broadcom</td>
</tr>
<tr>
<td>578</td>
<td>86</td>
<td>4.2</td>
<td>204</td>
<td>51</td>
<td>TR</td>
<td>X</td>
<td>Transmit function is missing AC coupling</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Transmit function include AC coupling.</td>
<td>O</td>
<td>Ghiasi, Ali Broadcom</td>
</tr>
<tr>
<td>579</td>
<td>86</td>
<td>86.4.3</td>
<td>205</td>
<td>29</td>
<td>TR</td>
<td>X</td>
<td>AC coupling are missing from receive function</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Receive function include AC coupling.</td>
<td>O</td>
<td>Ghiasi, Ali Broadcom</td>
</tr>
</tbody>
</table>
Comment Type: TR  Comment Status: X

It is not clear how the HOST NEXT is accounted for in current draft and there is nothing that prevents the host having excessive NEXT. If the amount of NEXT and FEXT for the host is equal to the test board the cable are tested with then the current methodology hold. I can see case there will be double counting of NEXT and FEXT in the case of a low noise host but in the cases of noisy host NEXT and FEXT can be under-estimated.

Suggested Remedy
To eliminated the case of noisy host, the host NEXT and FEXT must also meet 85-4, 85-5, and 85-6 equations.

Proposed Response  Response Status: O

Comment Type: TR  Comment Status: X

AC coupling in CR4/CR10 are between TP4 and Chip which comes from leagcay KR, specially with SR4/S10 defining the AC coupling in the module.

Suggested Remedy
AC coupling need to be between TP3 and MDI.

Proposed Response  Response Status: O

Comment Type: TR  Comment Status: X

In some applications products will be developed dual purpose, 40GbE or 4 10GbE per CL 52. These products will be able to operate longer and on leacy OM1 and PM2 fibres. A note should be added to the reach with Ref to CL 52.

Suggested Remedy
Note. If the transmitter and receiver are compliant to IEEE 10GBase-S CL 52.5 the reach on OM3 fibre would be 300 m.

Proposed Response  Response Status: O

Comment Type: TR  Comment Status: X

The classical DJ and RJ measured jitter are jitter PDF dependent and not valid for jitter distribution which are not dual-dirac.

Suggested Remedy
Replace RJ with UJ of 0.025 UI (RMS) per IEEE CL 68.6.8 method
Replace DJ with DDJ of 0.15 UI per method of FC-PI4 A.1.3.1 with PSBS 9 pattern

Proposed Response  Response Status: O

Comment Type: TR  Comment Status: X

Max and min loss between PMA IC and TP1a and TP4a are listed as TBD.

Suggested Remedy
SDD21<=(-0.0788 -0.6169*SQRT(f) - 0.5855*f)
Min loss
SDD>=(2/6 - 2*f/6)Where is in GHz
The maximum SDD21 assumes the HCB PCB loss at Nyquist is <=1.0 dB

Proposed Response  Response Status: O
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>File</th>
<th>Page</th>
<th>Line</th>
<th>Type</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Proposed Response</th>
<th>Response Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>586</td>
<td>7.1</td>
<td>177</td>
<td>30</td>
<td>TR</td>
<td>Max and min loss between PMA IC and TP1a and TP4a are not defined, the link will not work if there is 10 dB loss on the PCB</td>
<td>X</td>
<td>Proposed Remedy</td>
<td>O</td>
</tr>
<tr>
<td>587</td>
<td>6.5</td>
<td>211</td>
<td>19</td>
<td>TR</td>
<td>Loss from PMA function to TP1a and loss from TP4a to PMA function is SDD21&lt;=(-0.0788 -0.6169<em>SQRT(f) - 0.5855</em>f)</td>
<td>X</td>
<td>Proposed Remedy</td>
<td>O</td>
</tr>
<tr>
<td>588</td>
<td>9.3</td>
<td>186</td>
<td>10</td>
<td>TR</td>
<td>Max and min loss between PMA IC and TP1a and TP4a are not defined, the link will not work if there is 10 dB loss on the PCB</td>
<td>X</td>
<td>Proposed Remedy</td>
<td>O</td>
</tr>
<tr>
<td>589</td>
<td>8.4</td>
<td>182</td>
<td>50</td>
<td>TR</td>
<td>There is no definition how to test the receiver for compliance</td>
<td>X</td>
<td>Proposed Remedy</td>
<td>O</td>
</tr>
<tr>
<td>590</td>
<td>8.4</td>
<td>183</td>
<td>16</td>
<td>TR</td>
<td>There is no requirement on the min receive signal</td>
<td>X</td>
<td>Proposed Remedy</td>
<td>O</td>
</tr>
</tbody>
</table>

**Proposed Response:**

- **Ghiasi, Ali Broadcom**

**Comment Type:** TR

- **Comment Status:** X

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

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

- **Sort Order:** Comment ID

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10/31/2008 1:24:22 PM

Comment ID # 591
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Type</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>Proposed Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>592</td>
<td>TR/technical required</td>
<td>MJSP method of DJ and RJ breakdown is only valid for dual-Dirac jitter pdf, the DJ reported can even be 0 for cases the actual high freq jitter is very large.</td>
<td>X</td>
<td>Replace DJ with 99% probability jitter with symbol J2</td>
</tr>
<tr>
<td>593</td>
<td>TR/technical required</td>
<td>PMD loopback function is missing</td>
<td>X</td>
<td>Please add PMD loopback function</td>
</tr>
<tr>
<td>594</td>
<td>TR/technical required</td>
<td>Error rate for the Total jitter not defined</td>
<td>X</td>
<td>Add note TJ defined at BER 1E-15</td>
</tr>
<tr>
<td>595</td>
<td>TR/technical required</td>
<td>With faster process 24 ps is becoming limits the design options</td>
<td>X</td>
<td>Change 24 ps Rise/Fall time to 20 ps</td>
</tr>
</tbody>
</table>
# Proposals for Changes

## Comment ID # 600

**Comment Type:** TR

**Comment Status:** X

**Proposed Response**

**Ghiasi, Ali Broadcom**

**Transmitt compliance not yet defined**

**Suggested Remedy**

- Purpose: to use ghiasi_01_0708 min and max loss channel for transmitter compliance. Subset of s4p file can be included in the draft for either soft testing or building actual boards.

**Proposed Response**

**Response Status:** O

## Comment ID # 601

**Comment Type:** ER

**Comment Status:** X

**Proposed Response**

**Ghiasi, Ali Broadcom**

**please replace +- with symbol**

**Suggested Remedy**

- Replace with the frame symbol

**Proposed Response**

**Response Status:** O

## Comment ID # 602

**Comment Type:** TR

**Comment Status:** X

**Proposed Response**

**Ghiasi, Ali Broadcom**

**Inteference tolerance test not yet defined**

**Suggested Remedy**

- Purpose: to use ghiasi_01_0708 min and max loss channels for frequency dependent attenuator in 89A.2 test setup followed by a limiting Amplifier prior to interference injection. TP4 must have maximum jitter as defined in table 83A-1. Pre-emphasis can be adjusted to reach the TP4 J2=0.42 UI. Interference generator then adjusted to increase the total jitter to value listed in table 83A-2.

**Proposed Response**

**Response Status:** O

## Comment ID # 603

**Comment Type:** TR

**Comment Status:** X

**Proposed Response**

**Ghiasi, Ali Broadcom**

**please replace +- with symbol**

**Suggested Remedy**

- Replace with the frame symbol

**Proposed Response**

**Response Status:** O

## Comment ID # 604

**Comment Type:** TR

**Comment Status:** X

**Proposed Response**

**Ghiasi, Ali Broadcom**

**The reference impedance for differential return loss measurement is 100 ohms in the common mode section**

**Suggested Remedy**

- Please change to "The reference impedance for common mode s-parameters measurement is 25 ohms.

**Proposed Response**

**Response Status:** O

## Comment ID # 605

**Comment Type:** TR

**Comment Status:** X

**Proposed Response**

**Ghiasi, Ali Broadcom**

**The reference impedance for common mode s-parameters measurement is 25 ohms.**

**Suggested Remedy**

- Please change to "The reference impedance for common mode s-parameters measurement is 25 ohms.

**Proposed Response**

**Response Status:** O
Cl 86 SC 6.5 P 211 L 24 # 605
Ghiasi, Ali Broadcom

Comment Type TR  Comment Status X
Total jitter at TP4 is 0.7 UI which is the same as SFP+ single channel. The SR4/SR10 optics are more relax than SR optics but the SerDes tolerance is the same.

SuggestedRemedy
The Total Jitter at TP4 for SR4 and SR10 should be 0.65 UI. Since CR4/CR10 TJ are 0.28 UI if the optical link does not close then TJ in table 86-6 and 86-7 are suggested to be reduced to 0.28 UI

Proposed Response

Cl 83 SC 83.4 P 151 L 44 # 606
D'Ambrosia, John Force10 Networks

Comment Type T  Comment Status X
The first sentence of this clause is

The PMA Service Interface exists between the PMA client (the PCS or FEC sub-layer) and the uppermost PMA in a set of one or more stacked PMAs (possibly including an extender sub-layer).

An extender sub-layer was not been defined by the baseline, though the XLAUI / CAUI can be perceived in this fashion.

SuggestedRemedy
Suggested rewording -

The PMA Service Interface exists between the PMA client (the PCS or FEC sub-layer) and the uppermost PMA in a set of one or more stacked PMAs, as well as between stages in a stacked PMA.

Presentation to be provided

Proposed Response

Cl 01 SC 1.4 P 23 L 22 # 607
Ganga, Ilango Intel

Comment Type T  Comment Status X
Add 40GBASE-LR4 to the definitions list in 1.4

SuggestedRemedy
Insert the following text at line 22:

1.4.x 40GBASE-LR4: IEEE 802.3 Physical Layer specification for 40 Gb/s using 40GBASE-R encoding over four WDM lanes, long reach, single mode fiber. (See IEEE 802.3, Clause 87.)

Proposed Response

Cl 30 SC 30.5.1.1.14 P 27 L # 608
Ganga, Ilango Intel

Comment Type T  Comment Status X
update the text in 30.5.1.1.44 (802.3-2008) for 40 Gb/s and 100 Gb/s:

SuggestedRemedy
Change following text in 30.5.1.1.44 aFECmode after BEHAVIOUR DEFINED AS:

or FEC enable bit in 10/40/100BASE-R FEC control register (see 45.2.1.85);.

Proposed Response

Cl 30 SC 30.5.1.1.15 P 27 L # 609
Ganga, Ilango Intel

Comment Type T  Comment Status X
update text in 30.5.1.1.15 aFECCorrectedBlocks for 40 Gb/s and 100 Gb/s

SuggestedRemedy
change text after BEHAVIOUR DEFINED AS as follows:

For 1000BASE-PX or 10GBASE-R or 40GBASE-R or 100GBASE-R PHYs, a count of corrected FEC blocks. This counter will not increment for other PHY types.

Proposed Response
Cl 30 SC 30.5.1.1.16 P 27 L # 610
Ganga, Ilango Intel
Comment Type T Comment Status X
update text in 30.5.1.1.16 aFECUnCorrectableBlocks for 40 Gb/s and 100 Gb/s
SuggestedRemedy
change text after BEHAVIOUR DEFINED AS as follows:
For 1000BASE-PX or 10GBASE-R or 40GBASE-R or 100GBASE-R PHYs, a count of corrected FEC blocks. This counter will not increment for other PHY types.

Proposed Response Response Status O

Cl 83A SC 83A.3.3.3 P 284 L 41 # 611
Ganga, Ilango Intel
Comment Type T Comment Status X
Update the the Return loss definition and plots to be consistent with the definition and plots in the base standard (IEEE Std 802.3-2008, Annex 69B)
The Return Loss limits in Figure 83A–4 and Figure 83A–7 to be plotted in log linear scale with loss being positive (See 69B.4.5)

SuggestedRemedy

Proposed Response Response Status O

Cl 30 SC 30.3.2.1.2 P 27 L 15 # 612
Ganga, Ilango Intel
Comment Type TR Comment Status X
Add appropriate attribute for 40GBASE-R and 100GBASE-R
SuggestedRemedy
Insert the following attributes to the end of the list APPROPRIATE SYNTAX:
40GBASE-R Clause 82 40 Gb/s multilane 64B/66B
100GBASE-R Clause 82 100 Gb/s multilane 64B/66B
Also change the Note at the end of 30.3.2.1.3 (IEEE Std 802.3-2008) as follows:
NOTE—At 10 Gb/s, 40 Gb/s or 100 Gb/s the ability of the PMD must be taken into account when reporting the possible types that the PHY could be.

Proposed Response Response Status O
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>CI</th>
<th>SC</th>
<th>P</th>
<th>L</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>614</td>
<td>30</td>
<td>30</td>
<td>27</td>
<td>22</td>
<td>614</td>
</tr>
<tr>
<td>Comment Type</td>
<td>TR</td>
<td>Comment Status</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insert the following subclause 30.5.1.1.2 aMAUType and add 40G and 100G list</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>SuggestedRemedy</strong></td>
<td></td>
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</tr>
<tr>
<td>Insert the following to the aMAUType attribute list after 10GBASE-T.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>40GBASE-R Multilane R PCS/PMA as specified in Clause 82 over undefined PMD</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>40GBASE-KR4 40GBASE-R PCS/PMA over an electrical backplane PMD as specified in Clause 84</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>40GBASE-CRA 40GBASE-R PCS/PMA over 4 lane shielded copper balanced cable PMD as specified in Clause 85</td>
<td></td>
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</tr>
<tr>
<td>40GBASE-SRA 40GBASE-R PCS/PMA over 4 lane OM3 multimode fiber PMD as specified in Clause 86</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>40GBASE-LR4 40GBASE-R PCS/PMA over 4 WDM lane long reach single mode fiber PMD as specified in Clause 87</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>100GBASE-R Multilane R PCS/PMA as specified in Clause 82 over undefined PMD</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100GBASE-CR10 100GBASE-R PCS/PMA over 10 lane shielded copper balanced cable PMD as specified in Clause 85</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>100GBASE-SR10 100GBASE-R PCS/PMA over 10 lane OM3 multimode fiber PMD as specified in Clause 86</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100GBASE-LR4 100GBASE-R PCS/PMA over 4 WDM lane long reach single mode fiber PMD as specified in Clause 87</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100GBASE-ER4 100GBASE-R PCS/PMA over 4 WDM lane extended long reach single mode fiber PMD as specified in Clause 88</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Update the Register names in first paragraph after BEHAVIOUR DEFINED AS</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>PMA/PMD control 2 register</td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>PCS control 2 register</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change the last paragraph after BEHAVIOUR DEFINED AS as follows:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The enumerations 1000BASE-X, 1000BASE-XHD, 1000BASE-XFD, 10GBASE-X, 10GBASE-R, 10GBASE-W, 40GBASE-R and 100GBASE-R shall only be returned if the underlying PMD type is unknown.;</td>
<td></td>
<td></td>
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<tr>
<td><strong>Proposed Response</strong></td>
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<tr>
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<tr>
<td>Update the text in 30.5.1.1.4 (802.3-2008) for 40 Gb/s and 100 Gb/s:</td>
<td></td>
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</tr>
<tr>
<td>Change following text in 30.5.1.1.4 aMediaAvailable after BEHAVIOUR DEFINED AS:</td>
<td></td>
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<tr>
<td><strong>SuggestedRemedy</strong></td>
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</tr>
<tr>
<td>Change following text in 30.5.1.1.4 aMediaAvailable after BEHAVIOUR DEFINED AS:</td>
<td></td>
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</tr>
<tr>
<td>Any MAU that implements management of Clause 28 or Clause 73 Auto-Negotiation will map remote fault indication to MediaAvailable “remote fault.”</td>
<td></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change following text in 30.5.1.1.4 aMediaAvailable after BEHAVIOUR DEFINED AS in last paragraph:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10/40/100GBASE-R PCS Latched high BER status bit (45.2.3.12.2)</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td><strong>Proposed Response</strong></td>
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<td>Comment Type</td>
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<td>Comment Status</td>
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<td></td>
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<tr>
<td>Update attribute 30.6.1.1.5 aAutoNegLocalTechnologyAbility for 40G and 100G PHY types</td>
<td></td>
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<td></td>
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<tr>
<td><strong>SuggestedRemedy</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Insert the following to the list after 10GBASE-KRFD:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40GBASE-KR4FD Full duplex 40GBASE-KR4 as specified in Clause 84</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>40GBASE-CR4FD Full duplex 40GBASE-CR4 as specified in Clause 85</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>100GBASE-CR10FD Full duplex 100GBASE-CR10 as specified in Clause 85</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Change the text after BEHAVIOUR DEFINED AS as follows:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>This indicates the technology ability of the local device, as defined in Clause 28, Clause 37 and Clause 73.</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**Proposed Response**

<table>
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<tr>
<th>Response Status</th>
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**Proposed Response**

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<th>Response Status</th>
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**Proposed Response**

<table>
<thead>
<tr>
<th>Response Status</th>
<th>O</th>
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</thead>
</table>
Update 30B.2 ASN.1 module for CSMA/CD managed objects to add 40G and 100G PHY types

Suggested Remedy:

Insert following 3 lines to the list "AutoNegTechnology::= ENUMERATED" as follows:

Insert after 1000GBASE-TFD:
- 40GBASE-KR4 (822), --40GBASE-KR4 PHY as defined in Clause 84
- 40GBASE-CR4 (823), --40GBASE-CR4 PHY as defined in Clause 85
- 100GBASE-CR4 (8211), --100GBASE-CR10 PHY as defined in Clause 85

Insert following lines to the list after "TypeValue::= ENUMERATED" as follows:

Insert after 10GBASE-T:
- 40GBASE-R (821) Multilane R PCS/PMA as specified in Clause 82 over undefined PMD
- 40GBASE-KR4 (822) 40GBASE-R PCS/PMA over an electrical backplane PMD as specified in Clause 84
- 40GBASE-CR4 (823) 40GBASE-R PCS/PMA over 4 lane shielded copper balanced cable PMD as specified in Clause 85
- 40GBASE-SR4 (824) 40GBASE-R PCS/PMA over 4 lane OM3 multimode fiber PMD as specified in Clause 86
- 40GBASE-LR4 (825) 40GBASE-R PCS/PMA over 4 WDM lane long reach single mode fiber PMD as specified in Clause 87
- 100GBASE-R (8210) Multilane R PCS/PMA as specified in Clause 82 over undefined PMD
- 100GBASE-CR10 (8211) 100GBASE-R PCS/PMA over 10 lane shielded copper balanced cable PMD as specified in Clause 85
- 100BASE-SR10 (8212) 100GBASE-R PCS/PMA over 10 lane OM3 multimode fiber PMD as specified in Clause 86
- 100GBASE-LR4 (8213) 100GBASE-R PCS/PMA over 4 WDM lane long reach single mode fiber PMD as specified in Clause 88
- 100GBASE-ER4 (8214) 100GBASE-R PCS/PMA over 4 WDM lane extended long reach single mode fiber PMD as specified in Clause 88
Comment

Comment Type: TR
Comment Status: X

Suggested Remedy
Update 30B.2 ASN.1 module for CSMA/CD managed objects to add 40G and 100G PHY types.

Insert following lines to the list PhyTypeValue::= ENUMERATED:

40GBASE-R (82) -- Clause 82 40 Gb/s multilane 64B/66B
100GBASE-R (821) -- Clause 82 100 Gb/s multilane 64B/66B

Proposed Response: Response Status: O

Comment

Comment Type: TR
Comment Status: X

Service interface specification method and notation:
For all the service interfaces used in 802.3ba follow the definition used in 1.2.2 and be consistent with service interfaces used in the base specification (IEEE 802.3-2008).

This comment applies to Clause 82 to Clause 88.

In the base specification the only the parameters used in the primitive is a vector, none of the primitives are vectors. Whereas in 802.3ba the primitive is defined as a vector with just a single parameter. This is inconsistent with the base standard (IEEE Std 802.3-2008).

Change the service interface definition in 802.3ba to be consistent with the base standard.

For example the PMD service interface in Clause 86 is defined as follows:
PMD_UNITDATA.request\(tx\_bit0\), \(i=0..n\) or in otherwords
PMD_UNITDATA.request0(tx\_bit0)
PMD_UNITDATA.request1(tx\_bit1)
...
PMD_UNITDATA.requestn(tx\_bitn)

Instead define the primitives with parameter as vectors as in 802.3-2008:
PMD_UNITDATA.request(tx\_bit0, .. tx\_bit2, tx\_bit1, tx\_bit0)

Suggested Remedy
Change service interface definition in 802.3ba to be consistent with the base specification (IEEE Std 802.3-2008). Make this change globally to Clauses 80 through 88 and remove the editorial notes.

For example the PMD_UNITDATA.request primitive in PMD service interface will be redefined as follows:
PMD_UNITDATA.request\(tx\_bit0\), \(i=0..n\) or in otherwords
PMD_UNITDATA.request0(tx\_bit0)
PMD_UNITDATA.request1(tx\_bit1)
...
PMD_UNITDATA.requestn(tx\_bitn)

Change service interface definition in 802.3ba to be consistent with the base standard.
<table>
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<tr>
<th>Comment ID</th>
<th>Type</th>
<th>Comment Type</th>
<th>Comment Status</th>
<th>ER</th>
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</tr>
</thead>
<tbody>
<tr>
<td>621</td>
<td></td>
<td>T</td>
<td>X</td>
<td></td>
<td>What is the inherent reason to use ER of 4dB, which seems obvious odd? Suggest to change ER as 3.5dB or 6dB which look more realistic. (need to re-calculate the launch power numbers accordingly). Also RIN to be -132dB/Hz is tough, suggest -128dB/Hz.</td>
</tr>
<tr>
<td>622</td>
<td></td>
<td>T</td>
<td>X</td>
<td></td>
<td>In Table 88-9, Allocation for penalties is too optimistic, which is not comparable to even 10Gbase-LR signal channel specs. Suggest to consider adding the extra xtalk penalty, which should let the total penalties to fall within 3.5 to 4dB.</td>
</tr>
<tr>
<td>623</td>
<td></td>
<td>T</td>
<td>X</td>
<td></td>
<td>ER=8dB sound odd as compare with prevailing TX specs. As EML at 1310nm is assumed, suggest ER=8.2d or 6dB, which is more popular in ITU or IEEE specs. Also change RIN &lt;-132dB/Hz to -128dB/Hz for std specs.</td>
</tr>
</tbody>
</table>

CHANG, Frank Vitesse

Response Status: O
### Proposed Response

#### Cl 83 SC 83.2 P 148 L 44

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

Don't feel "Where the PMA is in the TX or RX direction" is enough to cover loopback function.

**Suggested Remedy:**  
Suggest such change sth like "Whether the PMA is unidirectional in the TX or RX direction, or bidirectional (for the sake of loopback)".

**Proposed Response**

#### Cl 83 SC 83.6.6 P 154 L 34

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

In 83.6.6, PMA loopback mode should support lineside loopback and diagnostic loopback functions.

**Suggested Remedy:**  
Suggest to define two kinds of loopback. In addition to lineside loopback illustrated in Fig 83-5, add the host-side loopback as 2nd option.

**Proposed Response**

#### Cl 83 SC 83.6.7 P 155 L 39

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

Agree with Editor comment on PRBS31 pattern is too long.

**Suggested Remedy:**  
Suggest to add short patterns like PRBS7, PRBS9 or even CJPAK etc in the text. (PRBS9 is well established in LRM.)

**Proposed Response**

#### Cl 86 SC 86.1 P 199 L 16

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

To make Fiber type OM3 clear.

**Suggested Remedy**  
Suggest to be consistent with Clause 52.5 10GBASE-S definition, indicating 2000MHz.km Minimum modal BW @850nm.

**Proposed Response**

#### Cl 86 SC 86.82 P 209 L 15

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

Table 86-8 need more rows, lack parameters.

**Suggested Remedy**  
Suggest to edit the following  
- Extra row for signaling speed as 4/10 x 10.3125GBd +/-100ppm.  
- Add Average launch power, each lane MIN specs as TBD  
- OLR tolerance should be MAX, not min, specs.  
- RIN12OMA should set to -128dB/Hz (-132dB/Hz would affect cost/yield)  
- Add TDP specs as TBD.

**Proposed Response**

#### Cl 86 SC 86.6.6 P 212 L 34

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

Allocation for penalty state TBD, which should be 8.3-1.9=6.4dB, the difference as compared with 10GBASE-SR should come related to the contribution from channel-to-channel xtalk.

**Suggested Remedy**  
Pls clarify.

**Proposed Response**
<table>
<thead>
<tr>
<th>Comment ID</th>
<th>Type</th>
<th>Comment</th>
<th>Proposed Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>633</td>
<td>TR</td>
<td>In Table 87-8, specifications should be MAX, not MIN.</td>
<td>Change RX reflectance as MAX specs. Add Stress eye jitter as condition for SRS test.</td>
</tr>
<tr>
<td>634</td>
<td>TR</td>
<td>In Table 87-9, allocation for penalties is optimistic.</td>
<td>Change RX reflectance as MAX specs. Add Stress eye jitter as condition for SRS test.</td>
</tr>
<tr>
<td>635</td>
<td>TR</td>
<td>In Table 88-8, RX reflectance specifications should be MAX.</td>
<td>Change RX reflectance as MAX specs. Add Stress eye jitter as condition for SRS test.</td>
</tr>
<tr>
<td>636</td>
<td>TR</td>
<td>In Table 88-12, penalties for 40km are too optimistic.</td>
<td>The penalties for 40km should be 0.5dB higher than 30km.</td>
</tr>
<tr>
<td>637</td>
<td>TR</td>
<td>I do not agree XLAU or CAUI is just for chip-to-chip interconnect.</td>
<td>The purpose of the XLAUI or CAUI is to provide a flexible chip-to-chip interconnection as well as the connection between optical modules and host ASIC board.</td>
</tr>
</tbody>
</table>
**Comment ID:** 639

**Comment Type:** E

**Comment Status:** X

**Proposed Remedy**

Typo in the block diagram, change "ALIGNMENT" to "ALIGNMENT"

**Suggested Remedy**

Per comment

**Comment ID:** 640

**Comment Type:** T

**Comment Status:** X

**Proposed Remedy**

As per the 83.6.6 the "uppermost" PMA in the stack provides loopback function. It is ambiguous which one is the "uppermost", on the linkside or the host side?

Also in a stacked PMA where the PMA's are separated, loop back is desirable in both places in the stack. E.g MAC/PCS/PMA implemented in a separate chip and PMA/PMD or PMA/FEC/PMA/PMD in a separate chip.

**Suggested Remedy**

Clarify the term "uppermost" PMA in 83.6.6.

**Comment ID:** 641

**Comment Type:** T

**Comment Status:** X

**Proposed Remedy**

A PMA is always bidirectional and contains both Transmit and Receive functions. So calling this as a separate RX PMA and TX PMA is confusing and this is not consistent through out the clause. In some references in this clause the PMA implies both e.g 20:10 PMA which includes both TX PMA and RX PMA.

So instead of referring this as RX and TX PMA, simply define the PMA as a single block which includes both Transmit and Receive functions. This methodology is consistent with the definitions of PCS/PMA/PMD which are all bidirectional with TX and RX functions.

**Suggested Remedy**

Define the PMA as a single block which includes both Transmit and Receive functions, illustrated in Fig 83-3 as single PMA block with TX and RX blocks inside the PMA. The TX function in the PMA connects to p input lanes and q output lanes. The RX function in the PMA connects to q input lanes and p output lanes. In this case the link status is associated with the RX function.

Also Change Fig 83-4 to illustrate both TX and RX functions

Also for primitives, the TX function can use PMA_UNIDATA.request and the RX function use PMA_UNIDATA.indication in the following manner

Transmit direction for data flowing from MAC to MDI
PMA_UNIDATA.request_in
PMA_UNIDATA.request_out

Receive direction
PMA_UNIDATA.indication_in
PMA_UNIDATA.indication_out

Signal indication
PMA_SIGNAL.indication_in
PMA_SIGNAL.indication_out

So this can be consistently mapped to the request and indication of PMD primitives or FEC primitives

Accordingly, update the text description and primitive definitions in 83.3
I would like to see a PMA line loopback (by which I mean data loopback from/to the PMD service interface) as a mandatory requirement. This is something that was not included in the original 802.3ae spec (10GE), but is widely implemented and used by the industry (primarily for PMD compliance testing).

Suggested Remedy
I will be making a contribution in Dallas to propose a remedy.

---

Do we need to specify what BER the Receiver sensitivity (OMA) parameter is specified for? I am assuming that it is BER=10^{-12} (same as stressed receiver sensitivity)?

We also need to clarify is this is the raw BER on the line or whether it is the effective BER after the error multiplication of the scrambler is taken into consideration (in which case the BER on the line is a factor of 3 less than specified). If it is indeed the former then we need to specify a way that it can be tested as this was an issue that came up in 10GE testing.

Suggested Remedy
One possible solution would be to define an unframed PRBS test mode with no 64/66B encoding or scrambling enabled, to be used for testing all of the PMD optical parameters. However I am not sure how this would work for an MLD based interface (which needs the 64/66B encoding and MLD lane markers to operate).

---

In keeping with nicholl_02_0508 and the follow-up discussion at the Munich meeting I would like to request that the size of the BER be increased from 6 bits to at least 24 bits.

Suggested Remedy
I will be providing a contribution in Dallas with a suggested remedy.