Cl **FM** *SC* **FM** *P* **1** *L* **1** # i-90

Law, David — Hewlett Packard Enter

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

As it seems likely that IEEE P802.3by will be the second amendment to IEEE Std 802.3-2015 please change '(Amendment of IEEE Std 802.3(TM)-2015)' to read 'Amendment of IEEE Std 802.3(TM)-2015 as amended by IEEE Std 802.3bw(TM)-2015)'.

SuggestedRemedy

See comment.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **FM** *SC* **FM** *P* **10** *L* **16** # i-91

Law, David — Hewlett Packard Enter

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

To match the latest IEEE 802.3 frontmatter document template <http://ieee802.org/3/WG_tools/templates/index.html> please add the additional sentence 'A full duplex MAC protocol was added in 1997' after the text 'Since 1985, new media options, new speeds of operation, and new capabilities have been added to IEEE Std 802.3.' at the end of the second paragraph of the introduction text.

SuggestedRemedy

See comment.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **FM** *SC* **FM** *P* **10** *L* **17** # i-35

Anslow, Peter — Ciena Corporation

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

The Introduction has been modified in the 802.3 template.

SuggestedRemedy

Add "A full duplex MAC protocol was added in 1997." to the end of the second paragraph.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **FM** *SC* **FM** *P* **11** *L* **12** # i-92

Law, David — Hewlett Packard Enter

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

Text needs updated based on the approval of IEEE Std 802.3bw-2015, the likelihood that IEEE P802.3by will be the second amendment to IEEE Std 802.3-2015, and the use of the (TM) symbol only on the first instance.

SuggestedRemedy

Suggest that:

[1] 'IEEE Std 802.3bw(TM)-201x' be to read 'IEEE Std 802.3bw-2015'.
[2] 'This amendment includes changes to IEEE Std 802.3-2015 and adds Clause 96.' be changed to read 'Amendment 1--This amendment includes changes to IEEE Std 802.3-2015 and adds Clause 96.'.
[3] 'IEEE Std 802.3by(TM)-201x' be changed to read 'IEEE Std 802.3by-201x'.
[4] 'This amendment includes changes to IEEE Std 802.3-2015 and adds Clause 105 ...' be changed to read 'Amendment 2--This amendment includes changes to IEEE Std 802.3-2015 and adds Clause 105 ...'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **FM** *SC* **FM** *P* **21** *L* **44** # i-93

Law, David — Hewlett Packard Enter

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

As IEEE Std 802.3bw-2015 has been approved, and it seems likely that IEEE P802.3by will be the second amendment to IEEE Std 802.3-2015, suggest that this text now be removed.

SuggestedRemedy

Suggest the text and the box be deleted.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **000** *SC* **0** *P* *L* # i-104

Stanton, Penny

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

Normative reference SFF 8665 is not cited in the draft. If it is needed for the implementation of the draft, please cite in text or please
verify if it has been cited in the base already (therefore not needing to be cited in this amendment).

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Subclause 110.11 refers to subclause 92.12.1.1 in the base document for a definition of the MDI. Subclause 92.12.1.1 makes a reference to SFF-8665. It was noted that the base document did not have a reference to SFF-8665 in 1.3, so it was included in P802.3by.

No changes are required to P802.3by.

Cl **000** *SC* **0** *P* **0** *L* **0** # i-19

RAN, ADEE

Intel Corporation

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

Within this draft we are inconsistent in using "a FEC" and "an FEC". In 105.3.3, 74.4 and 109C we have "an FEC"; in 107.1.4, 109.1.4 we have "a FEC".
We should decide if FEC is an acronym (pronounced like "feck") or an initialism (F-E-C)...
My impression is that the former is de facto accepted.
This inconsistency also exists in the base document. I am considering a maintenance request to align everything that isn't in scope of 802.3by.

SuggestedRemedy

Change "An FEC sublayer" to "A FEC sublayer" in 105.3.3, P79 L9.
Change "an FEC" to "a FEC" in 109C, P220 L14.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

The "IEEE Editorial Style Manual" recommends: "Indefinite articles are assigned to abbreviations to fit the sound of the first letter: an FCC regulation; a BRI." This suggests that the the choice of "a" versus "an" before an acronym is based on the pronunciation of the first letter of the acronym, not on the potential pronunciation of the acronym as a word. The "IEEE-SA Standards Style Manual" does not give any recommendations in this regard.

The use of "a FEC" versus "an FEC" in 802.3bx D3.2 Sections 4, 5, and 6 is not consistent. The phrase "a FEC" is used 7 times while the phrase "an FEC" is used 21 time. The use of "an FEC" is 3x more prevalent than "a FEC" in the base document.

Replace "a FEC" with "an FEC" in the following locations:
107.1.4, page 94, line 43
109.1.4, page 126, line 2

See comment #97.

Cl **000** *SC* **0** *P* **12** *L* **3** # i-12

Marris, Arthur — Cadence Design Syste

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

Five levels of numbering should be shown in the table of contents

SuggestedRemedy

Show five levels of numbering in the table of contents

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

The IEEE-SA Standards Style Manual states:
"A table of contents listing the main clauses (identified by one digit) and the first series of subclauses under each clause (identified by two digits) should be supplied. The next series of subclauses (identified by three digits) may be included when deemed appropriate by the IEEE-SA content publishing staff and the working group."

However, the IEEE 802.3 amendment template was recently updated to state:
"Both revisions and amendments to IEEE Std 802.3 show all five heading levels in the table of contents."

P802.3bx D3.2 includes 5 heading levels in the TOC.

Cl **001** *SC* **1.1.3.2** *P* **22** *L* **17** # i-23

RAN, ADEE — Intel Corporation

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

New item j (25GAUI) includes "conformance (...) is recommended, since it allows maximum flexibility in intermixing PHYs and DTEs at 25 Gb/s speeds".

This argument seems to apply to the xMII interface description (and also to XAUI) but is irrelevant and incorrect for 25GAUI, which is internal to the PHY sublayers.

Note that this comment also applies to the CAUI and XLAUI list items in the base standard.

SuggestedRemedy

Change "allows maximum flexibility in intermixing PHYs and DTEs" to "allows flexibility in intermixing PHY chips and modules".

Proposed Response *Response Status* **Z**

PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

Cl **001** *SC* **1.3** *P* **22** *L* **28** # i-94

Law, David — Hewlett Packard Enter

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

The title for SFF-8402 Rev 1.1 available at <ftp://ftp.seagate.com/sff/SFF-8402.PDF> doesn't include '1x'.

SuggestedRemedy

Suggest that '... SFP+ 28 Gb/s 1x Pluggable ...' be changed to read '... SFP+ 28 Gb/s Pluggable ...'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

The title of SFF-8402 Rev 1.1 includes "1x" but in a different position.

Change:
"SFP+ 28 Gb/s 1x Pluggable Transceiver Solution (SFP28)"

To:
"SFP+ 1X 28 Gb/s Pluggable Transceiver Solution (SFP28)"

Cl **001** *SC* **1.3** *P* **22** *L* **40** # i-95

Law, David — Hewlett Packard Enter

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

The revision of the SFF-8665 specification available at <ftp://ftp.seagate.com/sff> is Rev 1.9 dated June 29, 2015.

SuggestedRemedy

Update the reference 'SFF-8665, Rev 1.8, May 10, 2013, QSFP+ 28 Gb/s 4X Pluggable Transceiver Solution (QSFP28).' to read 'SFF-8665, Rev 1.9, June 29, 2015, QSFP+ 28 Gb/s 4X Pluggable Transceiver Solution (QSFP28).'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **001** *SC* **1.4** *P* **23** *L* **10** # i-89

Law, David — Hewlett Packard Enter

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

Based on definitions being in alphanumerical order shouldn't the definition for '25GBASE-SR' come after '25GBASE-R'?

SuggestedRemedy

Suggest that:

[1] '1.4.64g 25GBASE-R' should read '1.4.64f 25GBASE-R' and be place after 1.4.64e 25GBASE-KR-S.
[2] '1.4.64f 25GBASE-SR' should read '1.4.64g 25GBASE-SR' and be place after 1.4.64f 25GBASE-R.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **001** *SC* **1.4.134** *P* **23** *L* **35** # i-2

Hajduczenia, Marek — Bright House Network

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

Wrong position of ".".

SuggestedRemedy

Is "Clause 11)." and should be "Clause 11.)"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **030** *SC* **30.3.2** *P* **25** *L* **6** # i-13

Marris, Arthur — Cadence Design Syste

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

Correct subclause heading

SuggestedRemedy

Change:
PHY devicePHY device managed object class
To:
PHY device managed object class

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **030** *SC* **30.3.2.1.2** *P* **25** *L* **11** # i-96

Law, David — Hewlett Packard Enter

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

Change 'IEEE Std 802.3bw-201x' to read 'IEEE Std 802.3bw-2015' here and throughout draft.

SuggestedRemedy

See comment.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **030** *SC* **30.5.1.1.2** *P* **25** *L* **52** # i-3

Hajduczenia, Marek — Bright House Network

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

Please make sure all references to "IEEE Std 802.3bw-201x" are changed to "IEEE Std 802.3bw-2015" - it has bee approved as of this date, pending publication

SuggestedRemedy

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **030** *SC* **30.5.1.1.4** *P* **26** *L* **40** # i-103

RAN, ADEE — Intel Corporation

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

There is a possible discrepancy between 802.3by and 802.3bq in the way 25 Gb/s is addressed by this subclause: 802.3by adds it to the eighth paragraph (with 10 Gb/s) while 802.3bq assumed it is in the sixth paragraph (along with 40 Gb/s and 100 Gb/s, as "25 Gb/s and higher").

It may make more sense for 802.3 in general to move 25 Gb/s to the sixth paragraph. A comment is submitted to both 802.3by and 802.3bq. This should be coordinated by the two task forces.

SuggestedRemedy

Move the addition of "and 25 Gb/s" from the eighth paragraph to the sixth paragraph (Starting with "For 40 Gb/s and 100 Gb/s").

In the sixth paragraph, delete the first parentheses "(see 81.3.4)", since link_fault is defined in multiple clauses.

Proposed Response *Response Status* **Z**

PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

Cl **030** *SC* **30.5.1.1.15** *P* **27** *L* **1** # i-97

Law, David — Hewlett Packard Enter

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

Typo.

SuggestedRemedy

Suggest '... supports an FEC sublayer ...' should read '... supports a FEC sublayer ...' (strikeout text not shown).

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

The "IEEE Editorial Style Manual" recommends: "Indefinite articles are assigned to abbreviations to fit the sound of the first letter: an FCC regulation; a BRI." This suggests that the the choice of "a" versus "an" before an acronym is based on the pronunciation of the first letter of the acronym, not on the potential pronunciation of the acronym as a word. The "IEEE-SA Standards Style Manual" does not give any recommendations in this regard.

The use of "a FEC" versus "an FEC" in 802.3bx D3.2 Sections 4, 5, and 6 is not consistent. The phrase "a FEC" is used 7 times while the phrase "an FEC" is used 21 time. The use of "an FEC" is 3x more prevalent than "a FEC" in the base document.

Use of "an FEC" is okay.

See comment #19.

Beyond the comment and suggested remedy, in 30.5.1.1.16 page 27 line 21 the the word "optional" in strikethrough text is missing.

Change: "of the FEC sublayer"
To: "of the optional FEC sublayer"
And use strikethrough text for "optional ".

Cl **030** *SC* **30.5.1.1.16** *P* **27** *L* **25** # i-102

Law, David — Hewlett Packard Enter

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

Enumerations should be within double inverted commas.

SuggestedRemedy

Change '... enumerations 'BASE-R enabled' and ...' to read '... enumerations "BASE-R enabled" and ...'. Make similar changes for all referenced enumerations in Clause 30.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **045** *SC* **45** *P* **29** *L* **1** # i-5

Hajduczenia, Marek — Bright House Network

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

There are multiple instances of new "shall" statements and some instances of removed "shall" statements present in changes to Clause 45.
No PICS are present, though

SuggestedRemedy

Please add missing PICS for Clause 45 (updates, i.e., new PICS needed + changes to existing PICS)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

There is no existing PICS for 45.2.1.102.1 so removing the shall from 45.2.1.102.1 requires no PICS modification

The existing PICs item RM31 already adequately covers the new shall added in 45.2.3.9 so no change to the PICS is required for this shall.

For the shalls in 45.2.1.14, insert new PICS item MM149 at the end of table 45.5.3.3:

45.5.3.3 PMA/PMD management functions
Insert the following row at the end of table 45.5.3.3 PMA/PMD management functions:

MM149 - EEE deep sleep capability indicated for each port type - 45.2.1.14 - EEE:M

Cl **045** *SC* **45.2.1** *P* **29** *L* **13** # i-11

Marris, Arthur — Cadence Design Syste

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

There is no need to reference IEEE Std 802.3bn-201x

SuggestedRemedy

Change:
(as modified by IEEE Std 802.3bn-201x and IEEE Std 802.3bw-201x which inserted new registers at addresses 1.17 and 1.18)
To:
(as modified by IEEE Std 802.3bw-2015)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **045** *SC* **45.2.1.1** *P* **30** *L* **20** # i-4

Hajduczenia, Marek — Bright House Network

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

SC and RO are not present in shown Table 45-4, no need to present them.
There are also other footnotes to tables in Clause 45 that list bit types not listed in this amendment.

SuggestedRemedy

Remove ", SC = Self-clearing, RO = Read only" from footnote to Table 45-4

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **045** *SC* **45.2.1.4** *P* **31** *L* **3** # i-14

Marris, Arthur — Cadence Design Syste

Comment Type **G** *Comment Status* **D** *Bucket*

Remove mention of 802.3bn

SuggestedRemedy

Delete:
(as modified by IEEE Std 802.3bn-201x which inserted a row for bit 1.4.10)

Add new row 1.4.10 to table named "Reserved for future speeds"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Resolve using the response for comment i-33.

Cl **045** *SC* **45.2.1.4** *P* **31** *L* **3** # i-33

Anslow, Peter — Ciena Corporation

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

Since it is unlikely that the P802.3bn amendment will be approved before P802.3by completes, it is not appropriate to refer to 802.3bn in the editing instruction.

SuggestedRemedy

Change the editing instruction to: "Change the reserved row for 1.4.15:10 in Table 45-6 and insert two new rows immediately below as follows (unchanged rows not shown):"
Show the reserved row as being changed from "1.4.15:10" and add another row for "1.4.10", "Reserved", "Value always 0", "RO"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **045** *SC* **45.2.1.97** *P* **37** *L* **4** # i-18

Marris, Arthur — Cadence Design Syste

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

Register name needs improvement

SuggestedRemedy

Change register name from:
"CAUI-4 C2C and 25GAUI C2C transmitter equalization, receive direction, lane 0 register"
To:
"25GAUI C2C and CAUI-4 C2C lane 0 receive direction transmitter equalization register"

Also update following text as appropriate to accommodate this change. Make similar change for transmit direction in subclause 45.2.1.99.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

See response to comment i-34

Cl **045** *SC* **45.2.1.97** *P* **37** *L* **15** # i-34

Anslow, Peter — Ciena Corporation

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

The response to comment #21 against D2.1 changed all seven subclauses of 45.2.1.97 and 45.2.1.99 to remove all references to CAUI-4, chip-to-chip, and that this applies to lane 0. These subclauses were already difficult to understand because of the fact that there are transmitters in the receive direction and receivers in the transmit direction. The changes being made by P802.3by make the subclauses much harder to understand than they were previously.

SuggestedRemedy

Reinstate the strikethrough text and add 25GAUI throughout the subclauses of 45.2.1.97 and 45.2.1.99. For instance in 45.2.1.97.2, show the text as changing to:
The value of these bits indicates the value of the variable Requested_eq_c1 in the 25GAUI or lane 0 CAUI-4 receiver in the receive direction (see 83D.3.3.2). When Request_flag is equal to 1, this value indicates the ratio of the post-cursor coefficient c(1), which is requested for the transmitter equalization in the 25GAUI or lane 0 CAUI-4 C2C transmitter in the receive direction.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Implement suggested remedy and change subclause title and register name to "25GAUI C2C and lane 0 CAUI-4 C2C receive direction transmitter equalization register"

Cl **045** *SC* **45.2.3.6** *P* **43** *L* **3** # i-15

Marris, Arthur — Cadence Design Syste

Comment Type **G** *Comment Status* **D** *Bucket*

Remove mention of 802.3bq

SuggestedRemedy

Delete:
(as modified by IEEE Std 802.3bq-201x)

Change 110 entry to Reserved

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **045** *SC* **45.2.3.7** *P* **43** *L* **30** # i-16

Marris, Arthur — Cadence Design Syste

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

Remove mention of 802.3bq

SuggestedRemedy

Delete:
(as modified by IEEE Std 802.3bq-201x which inserted a row for bit 3.8.6)

Add additional row for bit 3.8.6 and mark it as reserved

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **073** *SC* **73.2** *P* **53** *L* **29** # i-6

Hajduczenia, Marek — Bright House Network

Comment Type **T** *Comment Status* **D** *gb/s vs gigabit, CC*

Inconsistent MII naming:
CGMII = 100 Gb/s MEDIA INDEPENDENT INTERFACE
XGMII = 10 Gb/s MEDIA INDEPENDENT INTERFACE
XLGMII = 40 Gb/s MEDIA INDEPENDENT INTERFACE
but
25 GIGABIT MEDIA INDEPENDENT INTERFACE

It is not clear why this one project among all new projects would choose to spell out GIGABIT rather than use "Gb/s" as done in newer projects.

SuggestedRemedy

Change
25 GIGABIT MEDIA INDEPENDENT INTERFACE
to
25 Gb/s MEDIA INDEPENDENT INTERFACE

Move the definition in Figure 73-1 to under XLGMII

Proposed Response *Response Status* **W**

PROPOSED REJECT.

This comment applies equally to Figure 73-1 and Figure 74-1.

The use of “25 GIGABIT MEDIA INDEPENDENT INTERFACE” rather than “25 GB/S MEDIA INDEPENDENT INTERFACE” is used to align with 10G terminology.

The proposed change, if accepted, would be pervasive, affecting front matter, interface descriptions in 1.1.3.2, definitions in 1.4, abbreviations in 1.5, as well as text and figures in Clauses 69, 73, 74, 105-112, and Annexes 109A-C.

However, both Figure 73-1 and Figure 74-1 incorrectly use “10 Gb/s MEDIA INDEPENDENT INTERFACE” rather than “10 GIGABIT MEDIA INDEPENDENT INTERFACE”. Since 10G is out of scope for the P802.3by task force, it is suggested that this be addressed through the 802.3 maintenance process.

Cl **073** *SC* **73.6.4** *P* **55** *L* **5** # i-20

RAN, ADEE — Intel Corporation

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

Missing dash in 25GBASEKR-S

SuggestedRemedy

Change 25GBASEKR-S to 25GBASE-KR-S

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **074** *SC* **74.1** *P* **59** *L* **11** # i-98

Law, David — Hewlett Packard Enter

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

The current IEEE Std 802.3-2015 subclause 74.1 text reads '... as shown in Figure 74-2, Figure 74-3, and Figure 74-4.' where Figure 74-2 is the 'Functional block diagram for 10GBASE-R PHYs', Figure 74-3 is the ' Functional block diagram for 40GBASE-R PHY' and Figure 74-4 is the 'Functional block diagram for 100GBASE-R PHY'.

SuggestedRemedy

Suggest the text '... as shown in Figure 74-2, Table 74-2a, and Figure 74-4.' be changed to read '... as shown in Figure 74-2, Figure 74-2a, Figure 74-3, and Figure 74-4.'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **074** *SC* **74.4.1a** *P* **61** *L* **21** # i-100

Law, David — Hewlett Packard Enter

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

Add the optional primitives for EEE operation (see Figure 105-3) to this figure.

SuggestedRemedy

Suggest that:

[1] An arrow be added from the PCS sublayer to the FEC sublayer labelled with:

FEC:IS_RX_MODE.request
FEC:IS_TX_MODE.request
FEC:IS_RX_LPI_ACTIVE.request
(EEE deep sleep only)

[2] An arrow be added from the FEC sublayer to the PCS sublayer labelled with:

FEC:IS_ENERGY_DETECT.indication
(EEE deep sleep only)

[3] An arrow be added from the FEC sublayer to the PMA sublayer labelled with:

PMA:IS_RX_MODE.request
PMA:IS_TX_MODE.request
(EEE deep sleep only)

[4] An arrow be added from the PMA sublayer to the FEC sublayer labelled with:

PMA:IS_ENERGY_DETECT.indication
PMA:IS_RX_TX_MODE.indication
(EEE deep sleep only)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **074** *SC* **74.5.1a** *P* **62** *L* **34** # i-99

Law, David — Hewlett Packard Enter

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

Subclause 74.5.1a '25GBASE-R service primitives' states that 'The FEC service interface for 25GBASE-R is an instance of the inter-sublayer service interface defined in 105.4' however the EEE related FEC service interface primitives list in this subclause do not follow the naming convention defined in subclause 105.4 (see page 60, line 25) and illustrated in Figure 105-3 'Optional inter-sublayer service interfaces for EEE deep sleep support'.

Subclause 74.5.1a

FEC_TX_MODE.request
FEC_RX_MODE.request
FEC_RX_TX_MODE.indication
FEC_LPI_ACTIVE.request
FEC_ENERGY.indication

Figure 105-3

FEC:IS_TX_MODE.request
FEC:IS_RX_MODE.request
FEC:IS_RX_TX_MODE.indication
FEC:IS_RX_LPI_ACTIVE.request
FEC:IS_ENERGY_DETECT.indication

SuggestedRemedy

Update the EEE related FEC service interface primitives described in subclause 74.5.1a to use the primitive names defined in subclause 105.4. I don't believe any other update is required as the remainder of Clause 74 as it uses the parameters communicated by the primitives, such as tx_mode by FEC:IS_TX_MODE.request.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **074** *SC* **74.5.1a** *P* **62** *L* **40** # i-101

Law, David — Hewlett Packard Enter

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

Aren't these primitives only required if the optional Energy Efficient Ethernet (EEE) capability with the deep sleep mode option is supported (see subclause 105.4.1, page 80, line 21).

SuggestedRemedy

Suggest the text ' Items d), e), f), g), and h) are only required for the optional EEE capability.' be changed to read ' Items d), e), f), g), and h) are only required for the optional Energy Efficient Ethernet (EEE) capability with the deep sleep mode.'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **074** *SC* **74.7.4.1.2** *P* **64** *L* **45** # i-7

Hajduczenia, Marek — Bright House Network

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

Serial comma missing in "Reverse gearbox function for 25GBASE-R, 40GBASE-R and 100GBASE-R"

SuggestedRemedy

Change to "Reverse gearbox function for 25GBASE-R, 40GBASE-R, and 100GBASE-R"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **078** *SC* **78.1.3.3.1** *P* **72** *L* **36** # i-17

Marris, Arthur — Cadence Design Syste

Comment Type **G** *Comment Status* **D**

Remove mention of 802.3bq

SuggestedRemedy

Delete "as modified by IEEE Std 802.3bq-201x"

Revert included changes included by 802.3bq by deleting "Except for BASE-T," on line 37 and "Except for BASE-T PHYs," on line 46.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **092** *SC* **92.8.4.4.3** *P* **425** *L* **45** # i-88

Dawe, Piers J G — Mellanox Technologie

Comment Type **TR** *Comment Status* **D** *Transition time, anchor*

There is an error in Eq. 92-22 and Eq. 93A-46: the Gaussian filter is sqrt(2) too fast.
110.8.4.2.4 refers to Eq. 92-22.
111.8.3.1 refers to 93.8.2.3 which refers to Annex 93C, 93C.2 item 7 says "Using the procedure defined in 93A.2" and 93A.2 contains Eq. 93A-46.
But 93C.2 item 7 also says "If a transmitter with high quality termination is used, in the COM calculation, the termination is modeled as ideal and a Gaussian low pass filter is added to Equation (93A-19), which has the same 20% to 80% transition time as the transmitter measured at TP0a", so the intent is clear.

SuggestedRemedy

Insert factor of 2 in both equations:
exp(-2*(pi*f*Tr/1.6832)^2)

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Filters based on equations 92-22 and 93A-46 do indeed create transition times that are significantly longer than Tr.

Equation 92-22 is referenced in 110.8.4.2.3. Equation 93A-46 is referenced indirectly in 111.8.3.1 (through reference to 93.8.2.3). In both places, a corrected equation should be used.

Any changes done in P802.3by should be limited to the scope of this project and should not affect 100G PHYs. The commenter may submit a maintenance request based on resolution of this comment to address 100G PHYs.

It is proposed to change equation 93A-46 in a manner that would not affect existing PHYs and refer to it in both cases.

Also, based on comment i-24, add an exception for the bandwidth of the measurement equipment used to make the transition time measurement.

Apply the following:

In 93A, add subclause 93A.2 "Test channel calibration using COM", with the instructions:
Change the last sentence in the paragraph before Equation 93A-46 from
"where Tr is the 20 to 80% transition time (see 86A.5.3.3) of the signal as measured at TP0a"
to
where Tr is the 20 to 80% transition time (see 86A.5.3.3) of the signal as measured at TP0a and A is 1 unless indicated otherwise in the PMD clause that invokes this method".

Change Equation 93A-46 to:
H_t(f) = exp(-A*(pi*f*T_r/1.6832)^2

In 110.8.4.2.3 item d, change
"the filter Ht(f) defined by Equation (92–22) where T_r is the 20% to 80% transition time (see 86A.5.3.3) of the signal as measured at the PGC reference point"
to
"the filter Ht(f) defined by Equation (93A–46) where T_r is the 20% to 80% transition time of the signal at the PGC and A=2. T_r is measured using the method in 86A.5.3.3 with the exception that that the filter bandwidth is 33 GHz instead of 12 GHz".

In 111.8.3.1, Change the first sentence to the following:

"The receiver interference tolerance test setup and method are as specified in 93.8.2.3, for a single lane, with the following exceptions:
a. The test requirements in this subclause replace the test requirements in Table 93–6.
b. The test channel COM is calculated with the transmitter device package model S(tp) omitted from the calculation. Instead, the voltage transfer function is multiplied by the filter H_t(f) defined by Equation (93A–46) where T_r is the 20% to 80% transition time of the signal at the Tx reference point and A=2. T_r is measured using the method in 86A.5.3.3 with the exception that the filter bandwidth is 33 GHz instead of 12 GHz."

[updated]

Cl **105** *SC* **105.1.3** *P* **77** *L* **39** # i-8

Hajduczenia, Marek — Bright House Network

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

In Table 105-1, it would be welcome to insert a forced line break in front of "(see ..." statement in Description column, to push all references into a separate line, to look like 25GBASE-KR-S entry

SuggestedRemedy

Per comment

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The parathesized text is part of the sentence and thus should have consistent spacing between letters and characters. It would look odd for a line of a sentence to end in the middle of a row.

Cl **105** *SC* **105.4.3.2.1** *P* **82** *L* **1** # i-9

Hajduczenia, Marek — Bright House Network

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

Is there any specific reason why arrows for FEC:IS_UNITDATA.request and PMA:IS_UNITDATA.indication have white spaces in them?

SuggestedRemedy

It seems like a leftover from a drawing that had multiple entries for these primitive names. Remove empty white boxes, unless dashed arrows have special meaning here (which is not noted).

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

It is assumed that the commenter is referring to Figure 105-2.

The breaks in the lines are indeed white boxes that were previously used as background for text that has since been removed.

Fix the lines such that they are continuous rather than broken.

Cl **105** *SC* **105.5** *P* **86** *L* **21** # i-52

Remein, Duane — Futurewei Technologie

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

Throughout this draft there are restrictions on maximum delay (ex 105.5, 106.1.4, 107.4, 108.4). No where are there placed any bounds on minimum delay or delay variation. Without some restriction (or at the very least a declaration of max delay variation) most time of day protocols cannot meet their stated objectives.

SuggestedRemedy

Place restrictions on maximum delay variation <OR> add the ability to add a mechanism to declare the max delay variation.

Proposed Response *Response Status* **Z**

PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

Cl **106** *SC* **106.3** *P* **91** *L* **7** # i-10

Hajduczenia, Marek — Bright House Network

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

Missing space between "100" and "ppm" in "390.625 MHz +/-100ppm"

SuggestedRemedy

Change to "390.625 MHz +/-100 ppm"
Also in PICS FS2 and FS4

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **107** *SC* **107.2** *P* **96** *L* **7** # i-27

RAN, ADEE — Intel Corporation

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

ber_cnt is defined as "count up to a maximum of 97", but hi_ber is defined as "... ber_cnt exceeds 97". There is a contradiction here (which originates from a similar contradiction in Clause 49).

According to the state diagram in Figure 49-15, hi_ber is asserted when the count _reaches_ 16, (not exceeds). Similar logic should be applied.

SuggestedRemedy

Change "exceeds 97" to "reaches 97".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **108** *SC* **108.5.3.1** *P* **108** *L* **41** # i-26

RAN, ADEE — Intel Corporation

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

Following comment #65 against D2.1.

"The status of the codeword marker lock process shall be reflected by the state variable FEC_align_status."

The codeword marker lock status is one of many status variables defined in this clause. No other variable is part of a normative statement ("shall be reflected"). There is no special reason to make an exception for this variable.

If the requirement stays normative, then text should be added to address what happens if MDIO is not implemented... but that doesn't seem justifiable for this variable.

SuggestedRemedy

Change "shall be reflected" to "is reflected".

Remove PICS item RF2.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **109** *SC* **109.1** *P* **126** *L* **2** # i-21

RAN, ADEE — Intel Corporation

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

"FEC device" is not well defined.
Annex 109C uses the wording "FEC (...) implemented in a separate device" which makes much more sense.

SuggestedRemedy

Change "use of a FEC device that is separate from the PCS" to "implementing a FEC sublayer in a device that is separate from the PCS".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **109** *SC* **109.1.1** *P* **124** *L* **8** # i-53

Dudek, Michael QLogic Corporation

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

Poor English

SuggestedRemedy

Add "of" between "family" and "25Gb/s"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **109** *SC* **109.4.2** *P* **129** *L* **21** # i-54

Dudek, Michael QLogic Corporation

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

There is only one input lane.

SuggestedRemedy

Change to "looping back the input lane to the output lane"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Since there is only one lane it is sufficient to refer to the output and/or input.

Change:
"looping back each input lane to the corresponding output lane"
To:
"looping back the input to the output"

Cl **109** *SC* **109.7.4.1** *P* **136** *L* **34** # i-67

Dawe, Piers J G Mellanox Technologie

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

PMA Functions

SuggestedRemedy

PMA functions

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **110** *SC* **110** *P* **138** *L* **2** # i-31

Hidaka, Yasuo Fujitsu Laboratories of

Comment Type **T** *Comment Status* **D** *Merge PHYs, BTI*

The only difference between 25GBASE-CR and 25GBASE-CR-S is whether RS-FEC is supported or not supported. Defining two PMDs obscure this difference, because we cannot conclude this is the only difference until we completely understand the specifications of two PMDs.
If we define RS-FEC as option, it is much clear and we don't need two PMDs.
The same comment on 25GBASE-KR and 25GBASE-KR-S.

SuggestedRemedy

Merge 25GBASE-CR and 25GBASE-CR-S to a single PMD of 25GBASE-CR with an optional RS-FEC.
Merge 25GBASE-KR and 25GBASE-KR-S to a single PMD of 25GBASE-KR with an optional RS-FEC.
Change Auto-Negotiation regarding to the optional RS-FEC.
More detail change will be provided in a presentation at January 2016 interim meeting.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Pending presentation and task force discussion.

Cl **110** *SC* **110.1** *P* **138** *L* **42** # i-69

Dawe, Piers J G Mellanox Technologie

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

This is written as if a CA-25G-L cable is not a CA-25G-N cable: "A 25GBASE-CR-S PHY supports operation over cable assemblies of types CA-25G-N and CA-25G-S, but not CA-25G-L." However, 110.10, Cable assembly characteristics, provides non-exclusive criteria for each cable type, so a CA-25G-L cable can be a CA-25G-N cable too. This should be made consistent.

SuggestedRemedy

As it would be expensive and pointless to certify that a particular cable fails CA-S or CA-N specs, the non-exclusive way seems better.
Delete ", but not CA-25G-L".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **110** *SC* **110.1** *P* **138** *L* **42** # i-68

Dawe, Piers J G — Mellanox Technologie

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

D2.1 comment 92 would apply here also:
What do you mean, "supports operation"?

SuggestedRemedy

Change "supports operation" to "operates", twice.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **110** *SC* **110.8.3** *P* **146** *L* **19** # i-55

Dudek, Michael — QLogic Corporation

Comment Type **TR** *Comment Status* **D** *TX parameters*

The specification for the peak pulse to steady stage voltage ratio is more relaxed than the value created in COM for cable testing resulting in the possibility of compliant Tx,'s Rx's and cables not meeting the BER requirements. See presentation Dudek_3by_01_0116

SuggestedRemedy

after 92.8.3.9 add "except that the Linear fit pulse peak (min) shall be 0.49*Vf" Also change the PICS TC17 to match.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Pending presentation and task force discussion.

See comment i-60.

Cl **110** *SC* **110.8.4** *P* **146** *L* **23** # i-25

RAN, ADEE — Intel Corporation

Comment Type **TR** *Comment Status* **D** *RX specs, anchor*

"Receiver electrical characteristics at TP3 for 25GBASE-CR and 25GBASE-CR-S PHYs shall be the same as those of a single lane of 100GBASE-CR4, as summarized in Table 92-7 and detailed in 92.8.4.2, 92.8.4.3 and 92.8.4.6"

92.8.4.6 is about "signaling rate range", which is covered in 110.8.4.4, so this reference is not required.

Of the parameters summarized in Table 92-7, Receiver input amplitude tolerance and Interference tolerance are defined explicitly in clause 110 so it is somewhat confusing to refer to another clause.

Also, the interference tolerance defined in 92.8.4.4 is not applicable for a single lane, and the interference tolerance test parameters in table 92-8 are modified for the no-FEC and BASE-R FEC modes. Therefore, the statement "... shall be the same as those of a single lane of 100GBASE-CR4, as summarized in Table 92-7..." is incorrect.

The only parts of Table 92-7 that are retained are return loss specifications. This can be said in a much simpler way.

SuggestedRemedy

Change the quoted text (the first sentence of the first paragraph of 110.8.4) to read:

"Receiver electrical characteristics for 25GBASE-CR and 25GBASE-CR-S are specified at TP3. Receiver shall meet the return loss requirements specified in 92.8.4.2 and 92.8.4.3."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

In 110.8.4, change:
"Receiver electrical characteristics at TP3 for 25GBASE-CR and 25GBASE-CR-S PHYs shall be the same as those of a single lane of 100GBASE-CR4, as summarized in Table 92-7 and detailed in 92.8.4.2, 92.8.4.3 and 92.8.4.6"
To:
"Receiver electrical characteristics are specified at TP3. Receiver shall meet the return loss requirements specified in 92.8.4.2 and 92.8.4.3.".

In 111.8.3, change:
"Receiver electrical characteristics at TP5a for 25GBASE-KR shall be the same as those of a single lane of 100GBASE-KR4, as summarized in Table 93–5 and detailed in 93.8.2.1 through 93.8.2.4."
To:
"Receiver electrical characteristics are specified at TP5a. Receiver shall meet the return loss requirements and detailed in 93.8.2.1 through 93.8.2.4."

Cl **110** *SC* **110.8.4.2** *P* **147** *L* **19** # i-36

Mellitz, Richard — Intel Corporation

Comment Type **TR** *Comment Status* **D** *RITT parameters, anchor*

Regarding Table 110-5
Adjusting Fitted insertion loss coefficients are not practical when performing an RITT test.

SuggestedRemedy

Remove Fitted insertion loss coefficients row.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Delete "Fitted insertion loss coefficients" rows from table 110-5, table 110-6, and table 110-7.

In the second paragraph of 110.8.4.2.3 (page 149, line 44)…
Change:
"The fitted insertion loss coefficients of the signal path between the reference points in 110–4, derived using the fitting procedure in 92.10.2, shall meet the values in Table 110–5, Table 110–6, or Table 110–7"
To:
"The fitted insertion loss at 12.89 GHz of the signal path between the reference points in 110–4, derived using the fitting procedure in 92.10.2, shall be within the limits in Table 110–5, Table 110–6, or Table 110–7"

Cl **110** *SC* **110.8.4.2** *P* **147** *L* **23** # i-37

Mellitz, Richard — Intel Corporation

Comment Type **TR** *Comment Status* **D** *RITT parameters, anchor*

Regarding Table 110-5
Approximate loss for stressing the receiver is not sufficient.

SuggestedRemedy

change row to "Minimum fitted loss at 12.89 GHz^b" Test 1 case is NA Test 2 case is 29.44"
add row to "Maximum fitted loss at 12.89 GHz^b" Test 1 case is 14.8 Test 2 case is NA"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

The parameters in tables 110-5, 110-6, and 110-7 should specify the minimum stress for the tests (the minimally required tolerance) and reasonable tolerance to make the tests implementable and repeatable.

In tables 110-5, 110-6, and 110-7, change the parameter name "Approximate fitted loss at 12.89 GHz" to "Fitted insertion loss at 12.89 GHz ", and set minimum and maximum values, as follows:

For test 1, in all 3 tables, minimum=14.8 and maximum=15.3.

For test 2:
-in table 110-5, minimum=29.44 and maximum=29.94
-in table 110-6, minimum=23.44 and maximum=23.94
-in table 110-7, minimum=22.48 and maximum=22.48.

Cl **110** *SC* **110.8.4.2** *P* **147** *L* **44** # i-105

Healey, Adam — Avago Technologies

Comment Type **TR** *Comment Status* **D** *"T error requirements, anchor*

Table 110-6 requires the block error ratio (defined as the number of corrected and uncorrected blocks divided by the total number of blocks) to be less than 2.1E-5. However, to meet the frame loss ratio objective, the number of uncorrected blocks divided by the total number of blocks is required to be 4.7E-10 (as calculated in http://www.ieee802.org/3/by/public/adhoc/architecture/ran_020415_25GE_adhoc.pdf). The requirement in Table 110-6 does not seem to be stringent enough since 1 uncorrected block for every 2.1E5 blocks is sufficient to pass the test but does not necessarily demonstrate that the frame loss ratio objective is met.

SuggestedRemedy

Require number of uncorrected blocks to be zero unless the test duration is such that ratio of uncorrected blocks to the total number of blocks received can be verified to be no greater than 4.7E-10.

Similar changes are required to 111.8.3.1.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

The current specification indeed enables passing the text with high uncorrected block count, which is undesirable. The suggested remedy would eliminate this possibility.

However, there is no precedence for specifying or addressing the duration or confidence level of the test. These are typically chosen by the test implementer. Test specifications only state the target error ratios.

Add a requirement for the uncorrected block ratio by applying the following:

Change the parameter in row 2 from "BASE-R FEC block error ratio required" to "BASE-R FEC corrected block ratio".

Add a new row with parameter "BASE-R FEC uncorrected block ratio required" with a footnote "b" (see below), and value "< 4.7e-10".

Replace table footnote "a" with:
"a. The corrected block ratio is measured using the FEC corrected blocks counter (see 74.8.4.1)."
Add new table footnote "b"
"b. The uncorrected block ratio is measured using the FEC uncorrected blocks counter (see 74.8.4.2)."

Apply corresponding changes to Table 111-5 in 111.8.3.1.

Cl **110** *SC* **110.8.4.2** *P* **147** *L* **47** # i-38

Mellitz, Richard — Intel Corporation

Comment Type **TR** *Comment Status* **D** *RITT parameters*

Regarding Table 110-6
Adjusting Fitted insertion loss coefficients are not practical when performing an RITT test.

SuggestedRemedy

Remove Fitted insertion loss coefficients row.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Resolve using the response to i-36.

Cl **110** *SC* **110.8.4.2** *P* **147** *L* **50** # i-39

Mellitz, Richard — Intel Corporation

Comment Type **TR** *Comment Status* **D** *RITT parameters*

Regarding Table 110-6
Approximate loss for stressing the receiver is not sufficient.

SuggestedRemedy

change row to "Minimum fitted loss at 12.89 GHz^b" Test 1 case is NA Test 2 case is 23.44"
add row to "Maximum fitted loss at 12.89 GHz^b" Test 1 case is 14.8 Test 2 case is NA"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Resolve using the response to i-37.

Cl **110** *SC* **110.8.4.2** *P* **148** *L* **14** # i-70

Dawe, Piers J G — Mellanox Technologie

Comment Type **E** *Comment Status* **D** *RITT error requirements*

Should not have a whole paragraph in a table footnote. Should not define the same thing twice.

SuggestedRemedy

Move the text to 110.8.4.2.5 e.g. before the last sentence. Here, have a short footnote such as "See 110.8.4.2.5".
Similarly for Table 111- 5, this could refer to 110.8.4.2.5 also.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Resolve using the response to i-105.

Cl **110** *SC* **110.8.4.2** *P* **148** *L* **28** # i-40

Mellitz, Richard — Intel Corporation

Comment Type **TR** *Comment Status* **D** *RITT parameters*

Regarding Table 110-7
Adjusting Fitted insertion loss coefficients are not practical when performing an RITT test.

SuggestedRemedy

Remove Fitted insertion loss coefficients row.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Resolve using the response to i-36.

Cl **110** *SC* **110.8.4.2** *P* **148** *L* **32** # i-41

Mellitz, Richard — Intel Corporation

Comment Type **TR** *Comment Status* **D** *RITT parameters*

Regarding Table 110-7
Approximate loss for stressing the receiver is not sufficient.

SuggestedRemedy

change row to "Minimum fitted loss at 12.89 GHz^b" Test 1 case is NA Test 2 case is 22.48"
add row to "Maximum fitted loss at 12.89 GHz^b" Test 1 case is 14.8 Test 2 case is NA"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Resolve using the response to i-37.

Cl **110** *SC* **110.8.4.2.1** *P* **148** *L* **51** # i-71

Dawe, Piers J G — Mellanox Technologie

Comment Type **E** *Comment Status* **D** *setup, nomenclature, anchor*

PGC is not a helpful name because it doesn't make much sense when the pattern generator/noise injector is disconnected when the test channel is being measured.

SuggestedRemedy

It's port 1 of the test channel, so we could call it CP1 (calibration point 1) or port 1, or just "Tx test reference point" or "Tx calibration point"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

PGC is the term that was used in previous clauses and suggests a direct connection to a test instrument. This test is different from previous clauses in that it requires noise injection before this reference point. Using the same name for a different point might cause confusion.

Apply the following changes:

In 110.8.4.2.1, change "at the pattern generator connection (PGC) or test references" to "at the test references".

In Figure 110-3…
Delete "PGC", the arrow, and the circle.
Change "Test reference" to "Tx test reference".
Delete the label "Tx" above the "PGC" label.

In 110.8.4.2.3… list items c and d…
Change: both "at the PGC" and "at the PGC reference point"
To: "at the Tx test reference point"

In Figure 110-4…
Change "Test reference" to "Tx test reference".
Delete the label "Tx" in upper left.

Cl **110** *SC* **110.8.4.2.1** *P* **148** *L* **51** # i-72

Dawe, Piers J G — Mellanox Technologie

Comment Type **T** *Comment Status* **D** *RITT setup*

Measuring a waveform at the output of a pattern generator isn't practical unless you have a scope with a small remote head.

SuggestedRemedy

Show a line or arrow (for a low loss instrument-grade cable) between the box called "Pattern Generator with noise injection" and PGC/Tx test reference, in figs 110-3 and 110-4.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

There should be one point of reference for both the TX parameter measurements and the test channel measurement.

When performing the test, measurements can be made the end of the cable that connects to the "additive host board loss" as the comment suggests. But meeting TX specifications at this point may be challenging and possibly require using short and/or expensive cables.

Alternatively, measurements can be made at the connector output of the "pattern generator with noise injection", which would make the aforementioned cable part of the test channel. This enables measuring the transmitter output with a separate instrument-grade cable while using a longer cable for connection to the "additive host board loss".

The current drawing does not enforce or preclude any of these choices.

Either way, measurements made at the reference point may need to be calibrated, e.g. to account for any required instrumentation cables.

Cl **110** *SC* **110.8.4.2.1** *P* **149** *L* **6** # i-73

Dawe, Piers J G — Mellanox Technologie

Comment Type **E** *Comment Status* **D** *RITT setup*

In Figure 110-3, the Test Channel includes both sides of the connector on the left, while the text in 110.8.4.2.2 does not mention the connector on the left.

SuggestedRemedy

Move the left dashed line called "MDI" to align with the join inside the connector.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

The dashed line near label "MDI" refers to the host side of the MDI connector. The label "MDI" is not intended to be a label for the line, but rather is intended to be a label for the connector.

Move the label "MDI" such that it more clearly indicates the intent noted above.

Cl **110** *SC* **110.8.4.2.1** *P* **149** *L* **8** # i-45

Mellitz, Richard — Intel Corporation

Comment Type **TR** *Comment Status* **D** *RITT setup*

"Additive host board loss" is not decriptive enough

SuggestedRemedy

Change to "Additional frequency dependant loss"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Resolve using the response to comment i-74.

Cl **110** *SC* **110.8.4.2.1** *P* **149** *L* **8** # i-74

Dawe, Piers J G — Mellanox Technologie

Comment Type **T** *Comment Status* **D** *RITT setup, anchor*

Figures 110-3 and 110-4 show "Additive host board loss" while 110.8.4.2.2 item c says "connecting path" - we should use the same name for something, every time. Do not recognise "additive host board", do not see loss as additive - the signal power is divided, the number of dBm is subtracted. Figure 83E-15, Example module stressed input test, calls it "Frequency-dependent attenuator" and "frequency-dependent attenuation". A pair of wideband SMA 3 dB attenuators could be seen as "Additive loss" - but they would not have the desired effect.
The meaning of "host board" is unclear - is it a kind of board I must use? What kind?

SuggestedRemedy

Rename to "Frequency-dependent attenuator" or "Frequency-dependent attenuation", both figures and text. Explain that this is intended to emulate the difference between the MCB loss and the loss in a host.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Apply the following changes:

Change the labels in Figures 110-3 and 110-4 from "Additive host board loss" to "Frequency-dependent attenuator".

In 110.8.4.2.2, change list item c to:
c) A frequency-dependent attenuator.

Add a new paragraph after the list:
"NOTE-The frequency-dependent attenuator represents the host channel and may be implemented with PCB traces and test cables."

Note that use of "Frequency-dependent attenuator" is consistent with 83A.5.2, see "Figure 83A–15—Stressed-eye and jitter tolerance test setup".

Cl **110** *SC* **110.8.4.2.1** *P* **149** *L* **9** # i-75

Dawe, Piers J G — Mellanox Technologie

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

Pattern Generator

SuggestedRemedy

Pattern generator

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **110** *SC* **110.8.4.2.2** *P* **149** *L* **22** # i-42

Mellitz, Richard — Intel Corporation

Comment Type **TR** *Comment Status* **D** *RITT setup*

Meeting COM is not sufficient wording and use for test case 1 in not clear

SuggestedRemedy

Change a) to: A cable assembly (see 110.10) that meets the cable assembly COM specified for the test being performed and is within 1 dB of IL_camax in table 110A-1 for test case 2 and IL_camin in table 110A-1 for test case 1.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Specify IL to be within a range based on IL_camin and IL_camax values in Table 110A-1.

In tables 110-5, 110-6, and 110-7:
Add a new row to each table with parameter: "Cable assembly fitted insertion loss at 12.89 GHz"
Test 1 value:
- in all 3 tables: min: 8 dB, max: 10 dB
Test 2 value:
- in table 110-5: min: 20.48, max: 22.48
- in table 110-6: min: 14.48, max: 16.48
- in table 110-7: min: 13.50, max: 15.50

Change 110.8.4.2.2 item "a"…
from
"A cable assembly (see 110.10) that meets the cable assembly COM specified for the test being performed."
to
"A cable assembly meeting the requirements of 110.10 and the fitted insertion loss specified for the test being performed."

Cl **110** *SC* **110.8.4.2.2** *P* **149** *L* **25** # i-43

Mellitz, Richard — Intel Corporation

Comment Type **TR** *Comment Status* **D** *RITT setup*

The transmitter test fixture may include some of the required additional loss.

SuggestedRemedy

Change b) to: A cable assembly test fixture (see 110B.1.2 and 92.11.2) or equivalent

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The text here defines a reference for the test channel construction. Implementations of the test setup may vary from the reference definitions as long as the required functionality and specifications are met.

Cl **110** *SC* **110.8.4.2.2** *P* **149** *L* **26** # i-56

Dudek, Michael — QLogic Corporation

Comment Type **T** *Comment Status* **D** *RITT setup*

It would be good to explicitly call out the "additive host board loss"

SuggestedRemedy

Add " which includes the additive host board loss of approximately 7dB at Nyquist" to the end of bullet c).

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Resolve using the response to comment i-74.

Cl **110** *SC* **110.8.4.2.2** *P* **149** *L* **26** # i-44

Mellitz, Richard — Intel Corporation

Comment Type **TR** *Comment Status* **D** *RITT setup*

"connecting path" seems unclear.

SuggestedRemedy

Change c) to: A frequnecy dependant connection path from the pattern generator to the CA test fixture.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Resolve using the response to comment i-74.

Cl **110** *SC* **110.8.4.2.2** *P* **149** *L* **26** # i-76

Dawe, Piers J G — Mellanox Technologie

Comment Type **E** *Comment Status* **D** *RITT setup*

from the pattern generator to the cable assembly test fixture.

SuggestedRemedy

from PGC to the cable assembly test fixture.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Resolve using the response to comment i-71.

[updated]

Cl **110** *SC* **110.8.4.2.3** *P* **149** *L* **33** # i-77

Dawe, Piers J G — Mellanox Technologie

Comment Type **E** *Comment Status* **D** *RITT setup, nomenclature*

In Figure 110-3, the same point is labelled Tx, PGC and Test reference. In Figure 110-4, there is a point called Tx and Test reference, but PGC is absent.

SuggestedRemedy

Make the figures consistent, e.g. add the missing label in Figure 110-4.
"Tx reference point" and "Rx reference point" would be better than "Test reference".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Resolve using the response to comment i-71.

Cl **110** *SC* **110.8.4.2.3** *P* **149** *L* **34** # i-78

Dawe, Piers J G — Mellanox Technologie

Comment Type **E** *Comment Status* **D** *RITT setup, nomenclature*

In Figure 110-4, there is a point called Rx test reference, but it doesn't seem to be associated with a receiver, except the one in the network analyser.

SuggestedRemedy

Call it TP4, as in Figure 110-2. Or CP2 or port 2

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

The Rx reference point label format is intended to match the one for the Tx side and is unique.

However, the response to comment i-71 changes the Tx "Test reference" label to "Tx test reference" and deletes "Tx" label in the upper left in Figure 110-4.

To match the reference point labeling on Tx side in Figure 110-4...
Change "Test reference" in lower right to "Rx test reference"
Delete "Rx" label in upper right.

Cl **110** *SC* **110.8.4.2.3** *P* **149** *L* **35** # i-46

Mellitz, Richard — Intel Corporation

Comment Type **TR** *Comment Status* **D** *RITT setup*

"Additive host board loss" is not decriptive enough

SuggestedRemedy

Change to "Additional frequency dependant loss"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Resolve using the response to comment i-74.

Cl **110** *SC* **110.8.4.2.3** *P* **149** *L* **44** # i-47

Mellitz, Richard — Intel Corporation

Comment Type **TR** *Comment Status* **D** *RITT parameters*

Adjusting Fitted insertion loss coefficients is not practical when setting up an RITT test.
Use fitted loss instead.

SuggestedRemedy

Replace paragraph with:
The fitted insertion loss s of the signal path between the reference points in 110-4, derived using the fitting procedure in 92.10.2, shall be at least the values in Table 110-5, Table 110-6, or Table 110-7, as appropriate for the test being performed."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Resolve using the response to comment i-36.

Cl **110** *SC* **110.8.4.2.3** *P* **149** *L* **53** # i-66

RAN, ADEE — Intel Corporation

Comment Type **T** *Comment Status* **D** *RITT parameters*

We have two sets of parameters for package model, and it is not specified which one should be used when calculating COM of the test channel;

This should not depend on the DUT construction, which is a "black box". Similarly, the channel signal path is defined to include S(HOSP), which is the reference board model, regardless of the actual board in the DUT.

I think using the larger package option should be used for the high loss case (test 2); if the DUT has a long package it will be adequate, and if it has a short package then it should not be penalized (by possibly adding more noise to compensate for lower loss).

For similar reasoning, the shorter package should be used for the low loss case (test 1),

Comment also applies to clause 111.

SuggestedRemedy

Specify, either in "test channel calibration" text or in the tables, using "test 1" value from table 110-10 for test 1 (low loss channel) and "test 2" value from table 110-10 for test 2 (high loss channel).

Apply equivalent changes in clause 111.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

It is ambiguous which test case from Table 110-10 should be used for determining the COM value for the purpose of noise calibration.

The channel used in this test is representative of a worst case cable assembly, so it should meet COM requirements in the same way as for a cable assembly. For a cable assembly, the COM value for the cable for both test cases must be larger than the specified value. In other words, the minimum of the two is compared to the COM specification. Similarly, the test channel COM for the purposes of noise calibration should use the smaller of values from the two test cases.

Change item (b) in the list in 110.8.4.2.3 (page 150) from:
"b) The COM parameters are as modified by Table 110–5, Table 110–6 or Table 110–7, as appropriate for the test being performed."
To:
"b) The COM parameters are as modified by Table 110–5, Table 110–6 or Table 110–7, as appropriate for the test being performed. COM is calculated using the two different device package model transmission line lengths listed for Test 1 and Test 2 in Table 110-10. The value of COM is taken as the minimum of the two calculated values."

[updated]

Cl **110** *SC* **110.8.4.2.3** *P* **150** *L* **3** # i-79

Dawe, Piers J G — Mellanox Technologie

Comment Type **T** *Comment Status* **D** *RITT setup*

This recipe is disorganised: one would not inject noise, measure SNDR, calculate COM then iterate the noise injected, measurement and calculation; one would calculate COM, iterate the noise TO BE injected, then inject it.

SuggestedRemedy

Re-order:
c) SNDR of the pattern generator after noise injection (see 110.8.4.2.4) is measured at the PGC using the procedure in 92.8.3.7. The resulting value is used as SNRTX in calculation of COM. The level of noise injected is adjusted until the required COM is achieved for the test.
to:
c) The value of SNRTX that brings COM to the required value for the test is found by calculation. Noise is injected (see 110.8.4.2.4) until the value of SNDR, measured at PGC using the procedure in 92.8.3.7, equals that value of SNRTX.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Item c is correct as written. The commenter points out alternate approach that is relevant, but not necessarily an improvement and the viable alternative.

See also response to comment i-71, which clarifies the test reference point.

Cl **110** *SC* **110.8.4.2.3** *P* **150** *L* **5** # i-80

Dawe, Piers J G — Mellanox Technologie

Comment Type **TR** *Comment Status* **D** *RITT setup*

This recipe needs to be brought back to reality, so the implementer has an idea if he has done it right or not, and to guard against mathematically valid but unrepresentative test setups.

SuggestedRemedy

Give a max/min range of SNDRs and/or RMS injected noises at PGC for each of the 6 tests. Are some of them the same?

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The proposed remedy does not include enough information to implement any specific change in the draft.

Cl **110** *SC* **110.8.4.2.3** *P* **150** *L* **6** # i-48

Mellitz, Richard — Intel Corporation

Comment Type **TR** *Comment Status* **D** *RITT setup*

The fact that a noise combiner/spitter is required at the test point PGC suggest that there will always an intruemented or the like drive. Hence the d) is not reflective of practice.

SuggestedRemedy

d) The transmitter device package model S
(tp) is omitted from the calculation of S_p

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

In 110.8.4.2.3
Change:
"If the pattern generator presents a high-quality termination, e.g., it is a piece of test equipment, the transmitter device package model S(tp) is omitted from the calculation of S_p."

To:
"The transmitter device package model S(tp) is omitted from the calculation of S_p."

The response to comment i-88 addresses a similar issue in Clause 111.

Cl **110** *SC* **110.8.4.2.3** *P* **150** *L* **7** # i-57

Dudek, Michael — QLogic Corporation

Comment Type **TR** *Comment Status* **D** *Transition time*

The equation 92-22 does not produce an equivalent Tx input risetime to the channel to that measured at PGC (and used as input to equation 92-22). (See dudek_3by_02_0116) (an earlier version presented to the ad-hoc is dudek_3by_12-2-15). For slower risetimes measured at PGC a faster risetime is input to the channel resulting in more noise being added in this test than should be.
If the Tx is not assumed to have a good termination and therefore the risetime is not compensated the test transmitter could input a significantly faster risetime to the channel in the Interference tolerance test than is used to calibrate the TxSNDR using COM resulting in an under-stressed Interference tolerance test.
When measuring the risetime at PGC the value obtained is slightly different depending whether the square wave test pattern or PRBS9 pattern is used. It would be good to remove this inconsistency and as the PRBS9 pattern is already required for measuring TxSNDR on this waveform the PRBS9 pattern is the best one to choose.

SuggestedRemedy

Remove the option of not compensating for the risetime of the test transmitter. Create a new local equation provided by Dudek_3by_02_0116 and refer to it instead of equation 92-22. Final paragraph to be "The transmitter device package model S(tp) is omitted from the calculation of Sp. Instead, the voltage transfer function is multiplied by the filter Ht(f) defined by Equation (New) where Tr is the 20% to 80% transition time (see 86A.5.3.3) of the signal as measured at the PGC reference point using the PRBS9 pattern."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Regarding removing the option for not compensating for rise time, resolve using the response to comment i-48.

Regarding the modification of the rise time filter equation, resolve using the response to comment i-88.

Regarding the use of PRBS9 pattern...
The transition time measurement in 86A.5.3.3 is general and has multiple options to choose from. Using PRBS9 creates a choice of using either TWDP or measured values for the 0% and 100% levels. The preference of using PRBS9 over a square wave to match the filter definition (which corresponds to the 20%-80% transition time of the step response) has not been demonstrated.

Pending presentation and task force discussion.

Cl **110** *SC* **110.8.4.2.3** *P* **150** *L* **8** # i-50

Mellitz, Richard — Intel Corporation

Comment Type **TR** *Comment Status* **D** *Transition time*

The filter Ht (f) defined by Equation (92-22) is non-casual and not represntiatve of transiston times slower that 15 ps.

SuggestedRemedy

add equation for h_t(f)
H_t=105./(f.^4*(k*tr)^4 - f.^3*(k*tr)^3*10i - 45*f.^2*(k*tr)^2 + f*(k*tr)*105i + 105)
where
k = 8.937-8E-09*(tr*1000)^4, f in GHz and tr in ns

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

The Bessel-Thomson filter in the suggested remedy is very close to a Gaussian filter.

The response to comment i-88, corrects the Gaussian filter response such that it results in the correct transition time.

Resolve using the response to comment i-88.

Cl **110** *SC* **110.8.4.2.3** *P* **150** *L* **8** # i-49

Mellitz, Richard — Intel Corporation

Comment Type **TR** *Comment Status* **D** *Transition time*

The filter Ht (f) defined by Equation (92-22) is non-casual and not represntiatve of transiston times slower that 15 ps.

SuggestedRemedy

Instead, the voltage transfer function is multiplied by the filter Ht(f) defined by Equation (110-xx)where Tr is the 20% to 80% transition time (see 86A.5.3.3) of the signal as measuredat the PGC reference point.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[Comment text is a copy of i-50.]

Resolve using the response to comment i-88.

Cl **110** *SC* **110.8.4.2.3** *P* **150** *L* **10** # i-24

RAN, ADEE — Intel Corporation

Comment Type **TR** *Comment Status* **D** *Transition time*

In item d), "T_r is the 20% to 80% transition time (see 86A.5.3.3) of the signal as measured at TP0a".

86A.5.3.3 specifies 10 GBaud measurement and includes a 12 GHz LPF, which would result in a an excessively high T_r. An exception should be made for to use 33 GHz filters.

Note that this comment also applies to similar text in 92.8.4.4.3 and 93A.2 in the base standard.

SuggestedRemedy

Change the text in item d from
"T_r is the 20% to 80% transition time (see 86A.5.3.3) of the signal as measured at TP0a"
to
"T_r is the 20% to 80% transition time of the signal as measured at TP0a. Transition time is measured as defined in 86A.5.3.3 with the exception that the filter bandwidth is 33 GHz instead of 12 GHz."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Resolve using the response to comment i-88.

Cl **110** *SC* **110.8.4.2.4** *P* **150** *L* **12** # i-81

Dawe, Piers J G — Mellanox Technologie

Comment Type **T** *Comment Status* **D** *RITT setup*

In my mind, a pattern generator and a noise source are two separate things; even they can be bought in the same box, they need not be.

SuggestedRemedy

Change subclause title to "Pattern generator and noise injection".
Change the last sentence from:
The pattern generator shall inject broadband noise on the data signal, with noise level set according to step c) in 110.8.4.2.3.
to
Broadband noise is added to the data signal before PGC, with noise level set according to step c) in 110.8.4.2.3.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change subclause 110.8.4.2.4 title to "Pattern generator and noise injection".

Change the last sentence of 110.8.4.2.4 from:
"The pattern generator shall inject broadband noise on the data signal, with noise level set according to step c) in 110.8.4.2.3."
To:
"Broadband noise is added to the test pattern before the TX test reference point, with noise level set according to step c) in 110.8.4.2.3."

See related comment i-71.

Cl **110** *SC* **110.8.4.2.4** *P* **150** *L* **13** # i-51

RAN, ADEE Intel Corporation

Comment Type **TR** *Comment Status* **D** *RITT parameters, anchor*

The receiver interference tolerance test method in clause 110 is quite different from the corresponding method in clause 111 (which is based on clause 93) in the specification of jitter in the transmitter.

It is desirable to be able to use a compliant 25GBASE-KR device as a transmitter in this test, which is possible in the clause 111 test. This will enable using the required test patterns and equalizer training and resemble a real-life scenario. However, the jitter requirements in clause 110 maybe impossible to meet in compliant 25GBASE-KR devices.

It is suggested to align the test methods in the two clauses.

SuggestedRemedy

A detailed presentation will be supplied.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Pending presentation and task force discussion.

Cl **110** *SC* **110.8.4.2.4** *P* **150** *L* **20** # i-82

Dawe, Piers J G Mellanox Technologie

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

This signal isn't data (see Clause 4), it's some form of scrambled idle or PRBS. In line 10 above we don't call it "data signal".

SuggestedRemedy

Delete "data".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Resolve using the response to comment i-81.

Cl **110** *SC* **110.8.4.3** *P* **150** *L* **41** # i-29

RAN, ADEE Intel Corporation

Comment Type **T** *Comment Status* **D** *Jitter tolerance test*

Jitter tolerance is measured "...with the channel and error requirement of test 2 as specified in..." referring to the corresponding receiver interference tolerance test.

The "channel" defined in the RITT tables has a required maximum COM (to be achieved by adding noise).

This requirement should not apply for the jitter test, since we assume the same physical channel is used without adding noise. But it is not stated clearly for the channel - the text only says that noise is not injected at the pattern generator.

Similar issues exists in 111.8.3.2.

SuggestedRemedy

Preferably, change "with the channel and error requirement of test 2" to "with a channel meeting the fitted insertion loss of test 2 and the error requirement", three times in this paragraph. The result in the first case would be:

"Jitter tolerance in RS-FEC mode is measured with a channel meeting the fitted insertion loss of test 2 and the error requirement as specified in Table 110-5."

Alternative possible remedies:

1. Insert at the end of the first paragraph of 110.8.4.3: "The channels used for jitter tolerance measurement are not required to meet the maximum COM specified."

2. Remove the COM-related rows from the tables and instead add text in 110.8.4.2.3 (Test channel calibration) specifying the target COM for each case.

The chosen remedy should also be applied similarly in 111.8.3.2.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change:
"Jitter tolerance in RS-FEC mode is measured with the channel and error requirement of test 2 as specified in Table 110–5. Jitter tolerance in BASE-R FEC mode is measured with the channel and error requirement of test 2 as specified in Table 110–6. Jitter tolerance in no-FEC mode is measured with the channel and error requirement of test 2 as specified in Table 110–7."

To:
"Jitter tolerance in RS-FEC mode is measured with a channel meeting the fitted insertion loss of test 2 and the error requirements as specified in Table 110–5. Jitter tolerance in BASE-R FEC mode is measured with a channel meeting the fitted insertion loss of test 2 and the error requirements as specified in Table 110–6. Jitter tolerance in no-FEC mode is

measured with a channel meeting the fitted insertion loss of test 2 and the error requirements as specified in Table 110–7."

Cl **110** *SC* **110.10** *P* **151** *L* **48** # i-83

Dawe, Piers J G — Mellanox Technologie

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

"achievable cable length of at least 5 m" excludes shorter cables. Table 110C-1 footnote a defines achievable length by "It may be possible to construct compliant cable assemblies longer than indicated".

SuggestedRemedy

Delete "at least" three times here.
In Table 110C-1 footnote a, insert before "It may be possible",
Shorter cable assemblies may be constructed, subject to 110.10 (in particular, the minimum insertion loss requirement).

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The use of the word "achievable" here does not preclude the use of shorter lengths of cable nor indicate they are not achievable.

See comment i-84.

Cl **110** *SC* **110.10** *P* **151** *L* **50** # i-84

Dawe, Piers J G — Mellanox Technologie

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

CA-25G-S isn't interesting enough: CA-25G-L gives a thinner cable, CA-25G-N gives lower latency, the extra length that CA-25G-S offers over CA-25G-N doesn't have enough Broad Market Potential because it doesn't get you anywhere in particular with respect to the size of equipment racks.

SuggestedRemedy

Consider moving the CA-25G-S specs to an informative annex.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

CA-25G-L is not an equivalent replacement for CA-25G-S because it requires the PHYs to operate in RS-FEC mode with the associated higher latency. The 25GBASE-CR-S does not include an RS-FEC, so there may be some compatibility issues.

CA-25G-S provides the opportunity for lower cost or thinner 3 m cables compared to CA-25G-N.

Cl **110** *SC* **110.10** *P* **151** *L* **52** # i-85

Dawe, Piers J G — Mellanox Technologie

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

If we keep three cable grades, the identifiers N S L will cause confusion for the foreseeable future. S has to be the short one, right? N is what, normal? So it's the middle one?
We should not insist on naming cable types according to FEC: that's not a cable function or property.

SuggestedRemedy

If we keep three cable grades, change CA-25G-N to CA-25G-X or CA-25G-XS (X or XS for extra short, like OIF CEI).
An alternative would be CA-25G-S CA-25G-M CA-25G-L, in that order (small medium large or short medium long).

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Each of the cable types are clearly explained and the unique specification for each are provided.

The suggested remedy does not improve clarity.

Cl **110** *SC* **110.10** *P* **151** *L* **53** # i-86

Dawe, Piers J G — Mellanox Technologie

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

I don't see a good reason for breaking the consensus of the September meeting (the last regular comment resolution), which was 15 dB for a 2.75 m cable. The numbers in the draft now (15.5 dB, 3 m cable) require a thicker cable than desirable, and the evidence I have seen about lengths tells me that 2.75 m is enough to cable up a normal rack.

SuggestedRemedy

Change 15.5 dB to 16 dB and 3 m back to 2.75 m for CA-25G-N.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The change of insertion loss to 15.5 dB was done in D2.1, based on Comment #118 against D2.0 and motion #5 of 802.3by in the September 2015 interim meeting. The previous value was 12.98 dB. The comment does not state any justification for changing the value to 16 dB.

The change of 2.75 m to 3 m was done with a clarification that these values indicate achievable lengths, and that "Length of a cable assembly does not imply compliance to specifications". This change does not preclude constructing a 2.75 cable as the comment suggests.

Cl **110** *SC* **110.10** *P* **152** *L* **17** # i-87

Dawe, Piers J G — Mellanox Technologie

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

Table 110-9, cable assembly characteristics summary, is misleading because it omits COM, one of the most important specs.

SuggestedRemedy

Insert a row for COM, refer to 110.10.7

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Add a new row in Table 110-9 with the following columns:
"Channel operating margin"
"110.10.7"
"See Table 110-10."
"--"

Delete redundant sentence on Page 152 line 4: "The COM requirements for the cable assembly types are specified in 110.10.7"

Cl **110** *SC* **110.10.1** *P* **152** *L* **17** # i-58

Dudek, Michael — QLogic Corporation

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

The critical parameter for the cables should be COM. The Interference Tolerance Test is also using an attenuation that is approximately 0.7dB larger than the max cable attenuation plus host board loss used in COM

SuggestedRemedy

Increase the attenuation for the CA-S cable to 17.18dB and the CA-N to 16.22dB in table 110-9 and in the text at lines 43 and 44 and the PICS CA3 and CA4. Also in table 110A-1 change the ILCamax to these values and change IlChmax to 29.70dB for CA-25G-S and to 28.74dB for CA-25G-N

Proposed Response *Response Status* **W**

PROPOSED REJECT.

In Clause 92, the 0.7 dB additional loss was introduced to reduce the required injected crosstalk for the same COM and to provide more consistency in spectral shape given the cable assembly to cable assembly crosstalk (noise) variations. It is used to test receiver "interference tolerance"; not intended to be used in extending channel loss budget.

The Clause 110 link budgets already take this into consideration based on consensus developed by the task force members.

Cl **110** *SC* **110.10.2** *P* **152** *L* **41** # i-32

RAN, ADEE — Intel Corporation

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

In 110.10.2, the IL upper limits refer to the measured value at 12.8906 GHz. In addition, there is a definition of fitted insertion loss in the first paragraph, but it is not used.

Insertion loss at a specific frequency is difficult to control and may have little effect on performance. Fitted IL is more important for performance.

The current RITT is also specified with fitted IL. It is preferable to align CA specs with RITT channel requirements and use the fitted value in both places.

Note that COM is a normative specification for cable assemblies, and seems to practically limit the insertion loss.

SuggestedRemedy

Change "The measured insertion loss" to "The fitted insertion loss", in the second paragraph and the third paragraph of 110.10.2 (4 times in total).

If this is not accepted, the fitted IL description is not required at all, so delete the first paragraph instead.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

IL is a critical parameter. IL is used as a proxy for length and as a means to partition elements of the channel. Our objectives are tied to lengths both of cable assemblies and expected host trace lengths.

Delete:
"The fitted cable assembly insertion loss Ilfitted(f) as a function of frequency f is defined in Equation (92-23)."

Cl **110** *SC* **110.10.7** *P* **153** *L* **49** # i-59

Dudek, Michael QLogic Corporation

Comment Type **TR** *Comment Status* **D** *COM parameters*

All CR-S and CR ports are required to meet the no-fec interference tolerance conditions and therefore will be capable of working over CA-S cables with equivalent required receiver performance.

SuggestedRemedy

Change the CTLE and Tx SNR COM parameters for CA-S in table 110-10 to match those for CA-N ie change max CTLE to -16dB and Tx SNR to 28.4dB

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Consensus for making the requested change has not been demonstrated.

See October 2015 Straw Poll #2 Option B.
http://www.ieee802.org/3/by/public/Oct15/minutes_01_3by_1015_approved.pdf

Cl **110** *SC* **110.10.7** *P* **154** *L* **19** # i-64

Dudek, Michael QLogic Corporation

Comment Type **T** *Comment Status* **D** *COM parameters*

Previous analysis of DFE error propagation did not take into account its deterministic nature described in Dudek_3by_03_0116 (earlier draft presented to the ad-hoc).

SuggestedRemedy

consider whether the limits on the maximum DFE tap weights should be changed in COM. (also for the Rx interference tolerance test)

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The suggested remedy does not include enough information to implement any specific change in the draft.

Pending presentation and task force discussion.

See comment i-65.

Cl **111** *SC* **111.8.2** *P* **174** *L* **5** # i-60

Dudek, Michael QLogic Corporation

Comment Type **TR** *Comment Status* **D** *TX parameters*

The specification for the peak pulse to steady stage voltage ratio is more relaxed than the value created in COM for channel testing resulting in the possibility of compliant Tx,'s Rx's and channels not meeting the BER requirements. See presentation Dudek_3by_01_0116

SuggestedRemedy

after 93.8.1.7 add "except that the Linear fit pulse peak (min) shall be 0.78*Vf" Also change the PICS TC19 to match.

Proposed Response *Response Status* **W**

PROPOSED REJECT.

Pending presentation and task force discussion.

See comment i-55.

Cl **111** *SC* **111.8.3** *P* **174** *L* **9** # i-62

Dudek, Michael QLogic Corporation

Comment Type **TR** *Comment Status* **D** *RX specs*

The KR-S phy also has to meet the return loss specs

SuggestedRemedy

Add a paragraph "Receiver return loss characteristics at TP5a for 25GBASE-KR-S shall be the same as those of a single lane of 100GBASE-KR4, as summarized in Table 93-5 and detailed in 93.8.2.1 and 93.8.2.2. The requirements in 111.8.3.1 and 111.8.3.2 also apply.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Resolve using the response to comment i-25.

Cl **111** *SC* **111.8.3.1** *P* **174** *L* **18** # i-61

Dudek, Michael QLogic Corporation

Comment Type **TR** *Comment Status* **D** *Transition time*

The equation 93A-46 does not produce an equivalent Tx input risetime to the channel to that measured at TP0a and used as input to equation 92-22. (See dudek_3by_02_0116) (earlier version presented to the ad-hoc dudek_3by_12-2-15). For slower risetimes measured at TP0a a faster risetime is input to the channel resulting in more noise being added in this test than should be.
If the Tx is not assumed to have a good termination and therefore the risetime is not compensated the test transmitter could input a significantly faster risetime to the channel in the Interference tolerance test than is used to test COM for the channel while calibrating the noise to be added resulting in an under-stressed Interference tolerance test.

SuggestedRemedy

Remove the option of not compensating for the risetime of the test transmitter and replace equation 93A-46 with a new local equation provided by Dudek_3by_02_0116. Add after "table 93-6" "and the transmitter device package model S(tp) is omitted from the calculation of Sp. Instead, the voltage transfer function is always multiplied by the filter Ht(f) defined by Equation (New B) where Tr is the 20% to 80% transition time (see 86A.5.3.3) of the signal as measured at the TP0a. (note this is a different filter from that used in Clause 93.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Resolve using the response to comment i-88.

Cl **111** *SC* **111.8.3.1** *P* **174** *L* **32** # i-28

RAN, ADEE Intel Corporation

Comment Type **TR** *Comment Status* **D** *RITT parameters*

The requirement in Table 111-4 is for "Insertion loss at 12.89 GHz". Insertion loss at a specific frequency is difficult to control and may have little effect on performance.

The corresponding RITT in clause 110 (table 110-5) includes "Approximate fitted loss at 12.89 GHz" instead. This makes much more sense.

There seems to be no reason to have misaligned requirements.

Comment also applies to Table 111-5 and Table 111-6.

SuggestedRemedy

Change "Insertion loss" to "Approximate fitted insertion loss" in tables 111-4, 111-5 and 111-6.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

The parameters in tables 111-4, 111-5, and 111-6 should specify the minimum stress for the tests (the minimally required tolerance) and reasonable tolerance to make the tests implementable and repeatable.

In tables 111-4, 111-5, and 111-6, apply the following changes:

Delete the row "Fitted insertion loss coefficients" in all 3 tables.

Change the parameter name "Insertion loss at 12.89 GHz" to "Fitted insertion loss at 12.89 GHz ", and set minimum and maximum values, as follows:

For test 1, in all 3 tables, minimum=16 and maximum=16.5.
For test 2:
-in table 111-4, minimum=35 and maximum=35.5
-in table 111-5, minimum=30 and maximum=30.5
-in table 111-6, minimum=30 and maximum=30.5.

Also, see the responses to comments i-36 and i-37.

Cl **111** *SC* **111.9** *P* **176** *L* **34** # i-65

Dudek, Michael QLogic Corporation

Comment Type **T** *Comment Status* **D** *COM parameters*

Previous analysis of DFE error propagation did not take into account its deterministic nature described in Dudek_3by_03_0116 (earlier draft presented to the ad-hoc).

SuggestedRemedy

consider whether the limits on the maximum DFE tap weights should be changed in COM. (also for the Rx interference tolerance test)

Proposed Response *Response Status* **W**

PROPOSED REJECT.

The proposed remedy does not include enough information to implement any specific change in the draft.

Pending presentation and task force discussion.

See comment i-64.

Cl **111** *SC* **111.9** *P* **176** *L* **37** # i-1

Obara, Satoshi FUJITSU

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

In the last paragraph, "92.9.3" seems to be typo.

SuggestedRemedy

Change "92.9.3" into "93.9.3".

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **112** *SC* **112.9** *P* **196** *L* **3** # i-30

King, Jonathan Finisar Corporation

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

Make the wording which links 'fiber optic channel model' tolink segment' in this section match previous optical clauses (eg 38,52,87,88).

SuggestedRemedy

Delete first sentence of 112.9.
Insert new sentence 'The fiber optic link model (channel) defined here is the same as a simplex fiber optic link segment.' immediately before the last sentence of 112.9 (which begins 'The term channel is used here...'.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT.

Cl **112** *SC* **112.11.4.2** *P* **200** *L* **28** # i-63

Dudek, Michael QLogic Corporation

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

There is only one optical transmitter.

SuggestedRemedy

change "all ot the optical transmitters" to "the optical transmitter" Also on line 36 and line 40 change "any" to "the"

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

[The editor changed the subclause from 112.4.2 to 112.11.4.2 since the commenter is referring to CM2, CM4, and CM5 management functions in the PICS tables.]

[The editor changed the subclause from 112.4.2 to 112.11.4.2 since the commenter is referring to CM2, CM4, and CM5 management functions in the PICS tables.]

In 112.11.4.2:

In the row for item CM2, replace the sentence:
"Disables all of the optical transmitters with the PMD_global_transmit_disable variable"
with:
"Disables the optical transmitter with the PMD_global_transmit_disable variable"

In the row for item CM4, replace the sentence:
"Sets PMD_transmit_fault to one if a local fault is detected on any transmit lane"
with:
"Sets PMD_transmit_fault to one if a local transmitter fault is detected"

In the row for item CM5, replace the sentence:
"Sets PMD_receive_fault to one if a local fault is detected on any receive lane"
with:
"Sets PMD_receive_fault to one if a local receiver fault is detected".

[updated]