Cl **120F** *SC* **120F.3.2.4** *P* **210** *L* **29** # 11036

Ben Artsi, Liav — Marvell

Comment Type **T** *Comment Status* **A** *jitter tolerance [CC]*

[Comment resubmitted from Draft 1.1. SC120F.3.2.4, P207, L22]

Reciever jitter tolerance test is specified at specific frequency points with no specified extrapolation between frequency points. More specifically, 5UI at 40KHz, 0.15UI at 1.33MHz 0.05UI at 4-40MHz. Tx is measured when applying high pass filter on the jitter filtering out much of the low frequency jitter of a transmitter. A transmitter may still comply with the TX specifications and have much more than 0.15UI of jitter at frequecies which reside around a few handers of Hz. Since there is no Rx jitter tolerance requirement at these frequencies: A transmitter may have relatively high jitter at low frequencies and still be compliant. The Rx may not be able to tolerate this jitter while being compliant as well. The interoperability between these specified Tx and Rx is questionable.

SuggestedRemedy

Add a sentence that the reciever is expected to meet any frequency point between the specified in table 163-9 while jitter tolerance requirement is linearly extrapolated between any consecutive specified frequency points.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE

Resolve using the response to comment #146.

Cl **161** *SC* **161.6.22** *P* **131** *L* **31** # 101

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **A** *FEC*

RS-FEC codewords arrive every 51.2ns for 100G operations. A 32b codeword counter will saturate in about 3.5 minutes. A 40b counter would saturate in about 15.5 hours at 100G. A 48b counter would saturate in 166 days at 100G.

SuggestedRemedy

Increase the size of the cw_counter to 48b to provide long term testing without constant polling of the system (especially if these counters were extended to be available for 400G or 800G operations)

Response *Response Status* **C**

ACCEPT

Cl **162** *SC* **162.5** *P* **140** *L* **18** # 11164

Palkert, Tom — Molex

Comment Type **T** *Comment Status* **R** *Medium delay*

[Comment resubmitted from Draft 1.1. 162.5, P135, L18]

One way delay thru medium of 14ns is insufficient for DAC delay times.

SuggestedRemedy

Change value back to 20 ns

Response *Response Status* **C**

REJECT

The commenter is encouraged to provide more in depth analysis to support the proposed remedy.

Cl **162** *SC* **162.8.11** *P* **147** *L* **27** # 103

Healey, Adam — Broadcom Inc.

Comment Type **T** *Comment Status* **A** *Tx electrical*

An expand set of predefined equalizer settings would be useful. The ability to select an initial condition closer to the target settings can be expected to improve robustness and decrease training time (due to a reduction in the number of iterative updates).

SuggestedRemedy

Add bit 11 of the control field (currently reserved) to "Initial condition request" to enable the definition of up to 7 presets with encoding 000 being "Individual coefficient control". The equalizer settings corresponding to each preset will be specified in 162.9.3.1.3 as already stated.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE

Implement with editorial license the updates provided on slide 5 of the following presentation.
http://www.ieee802.org/3/ck/public/20_07/heck_3ck_03_0720.pdf

Cl **162** *SC* **162.9.3.1.3** *P* **151** *L* **30** # 142

Ran, Adee Intel

Comment Type **T** *Comment Status* **D** *Tx electrical*

Cross-clause

The OUT_OF_SYNC setting is the initial setting used when bringing up a link. It is likely not the optimal setting in many cases, and may not be a good starting point, which can cause long link-up times.

In cases where the channel and link partner are known (typical in backplane or C2C), another initial setting may be preferable.

To enable fast link up in such cases, it is proposed that the coefficients in OUT_OF_SYNC state be taken from MDIO registers instead of being fixed. The default values of the registers will create the current preset 1 settings [0 0 0 1 0], so that when the channel is unknown the behavior is unchanged from D1.2.

SuggestedRemedy

Two new sets of R/W registers should be allocated. Each set corresponds to the 5 coefficient values, one register each.
"Initial coefficient vector" hold the values that will be set in OUT_OF_SYNC.
"Current coefficient vector" holds the current coefficients.

The encoding of these registers is implementation dependent, but is consistent between the sets.

Presentation with more details is planned.

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **162** *SC* **162.9.3.1.3** *P* **151** *L* **30** # 104

Healey, Adam Broadcom Inc.

Comment Type **T** *Comment Status* **A** *Tx electrical*

In Table 162-10, the coefficient initial conditions for presets 2 and onward are TBD.

SuggestedRemedy

Define the coefficient initial conditions (presentation with proposed values to be provided).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE

The following presentations were reviewed:
http://www.ieee802.org/3/ck/public/20_07/healey_3ck_01_0720.pdf
http://www.ieee802.org/3/ck/public/20_07/heck_3ck_03_0720.pdf

Update the coefficient initial conditions according to slide 6 of heck_3ck_03_0720.

Implement with editorial license.

Cl **162** *SC* **162.9.3.1.3** *P* **151** *L* **33** # 143

Ran, Adee Intel

Comment Type **T** *Comment Status* **A** *Tx electrical*

(cross-clause)
Transmitter presets 2 and 3 are currently TBDs.

It is proposed to use these presets as starting points for high-loss and low-loss channels.

Preset 2 in the suggested remedy is based on COM simulations of 2 m cable + 2*110 mm host board, and 1.5 m cable + 2*55 host board, and several backplane channels (results are quite similar).

Preset 3 for in the suggested remedy is aimed at short reach channels (more relevant for backplane/C2C), has minimum c(0) assumed in COM and no equalization, for channels that may need reduced swing. Even if equalization is required, this can be used as a convenient starting point of an optimization algorithm.

Presets are based on the maximum allowed step size of 2.5% and should have a tolerance of one step.

Clause 163 and Annex 120F do not have explicit settings but are going to be affected by this change.

SuggestedRemedy

Change the TBD values in the table as follows:

Preset 2: -0.025, 0.075, -0.25, 0.65, 0
Preset 3: 0, 0, 0, 0.525, 0

Set tolerance of +/- 0.025 for all presets (including preset 1 and OUT_OF_SYNC).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE

Resolve using the response to comment #104.

Cl **162** *SC* **162.9.4.4.2** *P* **156** *L* **50** # 146

Ran, Adee Intel

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

Comment #33 against D1.1 suggested jitter tolerance requirements at additional frequencies between the measurement points of Table 120D–7, but only addressed clause 163. The same argument also holds in 162 (which currently points to Table 120D–7) and in 120F (which has Table 120F–5, identical to Table 163–9).

SuggestedRemedy

To address the concern of comment #33 in all 3 places together:

1. Add another column in Table 120F–5, with frequency 0.4 and amplitude 0.5, changing the labels in the first row as necessary.
2. Change the reference in 162.9.4.4.2 from Table 120D–7 to Table 120F–5.
3. In 163.9.2.4, either delete Table 163–9 and refer to Table 120F–5 instead, or apply similar changes to Table 163–9.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE

In Table 163-9, add another column with frequency 0.4 and amplitude 0.5, changing the labels in the first row as necessary.

Move Table 163-9 to Clause 162 in place of reference to Table 120D-7.

Refer to this table from the jitter tolerance subclauses in Clause 163 and Annex 120F.

Implement with editorial license.

Cl **163** *SC* **163.9.2.4** *P* **183** *L* **23** # 11033

Ben Artsi, Liav
Marvell

Comment Type **T** *Comment Status* **A** *jitter tolerance [CC]*

[Comment resubmitted from Draft 1.1. 163.9.2.4, P180, L47]

Reciever jitter tolerance test is specified at specific frequency points with no specified extrapolation between frequency points. More specifically, 5UI at 40KHz, 0.15UI at 1.33MHz 0.05UI at 4-40MHz. Tx is measured when applying high pass filter on the jitter filtering out much of the low frequency jitter of a transmitter. A transmitter may still comply with the TX specifications and have much more than 0.15UI of jitter at frequecies which reside around a few handers of Hz. Since there is no Rx jitter tolerance requirement at these frequencies: A transmitter may have relatively high jitter at low frequencies and still be compliant. The Rx may not be able to tolerate this jitter while being compliant as well. The interoperability between these specified Tx and Rx is questionable.

SuggestedRemedy

Add a sentence that the reciever is expected to meet any frequency point between the specified in table 163-9 while jitter tolerance requirement is linearly extrapolated between any consecutive specified frequency points.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE

Resolve using the response to comment #146.