Cl **120G** *SC* **120G.1** *P* **218** *L* **48** # 71

Mellitz, Richard Samtec

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

The equation is only reccomended. The way 120G-1 is anotated before the graph is anotated suggest that that it is required for performance.

SuggestedRemedy

Add section titled 120G.1.1 Informative IL

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

For the 100GAUI-1 and 200GAUI-2 descriptions, Equation 120G-1 is introduced as follows: "The supported insertion loss budget is characterized by Equation (120G-1) and illustrated in Figure 120G-5."

For the 400GAUI-4 description, Equation 120G-1 is introduced as follows: "The recommended insertion loss budget is characterized by Equation (120G-1) and illustrated in Figure 120G-5."

Both "supported" and "recommended" are not correct here. Should reflect that the IL specification reflects the intended lossiest channel.

Change the wording to reflect this.

Note that the three referenced paragraphs are being merged together per the response to closed comment #91.

As the comment recommends, it would be beneficial to package up the channel specification in a channel subclause similar to 120F.4 "Channel characteristics".

Move the channel specifications to a new subclause "120G.4 Channel characteristics".

Implement with editorial license.

Cl **120G** *SC* **120G.1** *P* **218** *L* **48** # 72

Mellitz, Richard Samtec

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

The equation is only reccomended. The way 120G-1 is anotated before the graph is anotated suggest that that it is required for performance.

SuggestedRemedy

Add section titled 120G.1.2 Informative COM based on sun_3ck_01a_0120.pdf slide 29 and 30

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Contrary to the comment, the suggested remedy is proposing to add an additional informative constraint on the channel using COM with reference to a previously reviewed presentation.

The comment provides no justification for the proposed changes in the suggested remedy.

There is no consensus to make the proposed change at this time.

Cl **120G** *SC* **120G.1.1** *P* **219** *L* **26** # 92

Ghiasi, Ali — Ghiasi Quantum/Inphi

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

The bit error ratio (BER) not clear if this is pre or post .

SuggestedRemedy

The pre-FEC bit error ratio (BER) provided that the error statistics are sufficiently random when processed ...

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

To address the comment, the leading portion of the sentence (see below) defines the BER as being measured after being processed by the PMA and, by exclusion, not an FEC; thus without error correction.
"The bit error ratio (BER) when processed according to Clause 135 for 100GAUI-1 C2M or Clause 120 for 200GAUI-2 or 400GAUI-4 C2M."

The proposal in the suggested remedy goes beyond the concerns raised in the comment. The processing by a particular FEC is only relevant when defining an entire PHY. The BER specifications for PMDs that might be associated with this interface include allocation for errors, including worst case burst errors, for this interface.

Concerns relating to the errors bursts was addressed in the response to D1.0 comment #202.
http://www.ieee802.org/3/ck/comments/8023ck_D10_final_closedcomments_200128.pdf

No further specification is required.

However, it would be helpful to clarify that the processing is by the PMA only.

Change: "processed according to"
To: “processed by the PMA according to”

Cl **120G** *SC* **120G.3.1** *P* **221** *L* **28** # 127

Ghiasi, Ali — Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **R**

Module ouptut also needs common mode return loss

SuggestedRemedy

RLCC=12-9*f dB, from 10 MHz to 1 GHz
RLCC=3 dB 1 to 53 GHz
See ghiasi_3ck_03_0320

Response *Response Status* **C**

REJECT.

The comment is intended to refer to the host output.

Slide 9 of the following presentation was reviewed by the task force.
http://www.ieee802.org/3/ck/public/20_03/ghiasi_3ck_03a_0320.pdf

There was concern expressed about whether this specification is required and whether the limits are appropriate.

There is no consensus to implement the suggested remedy.

Cl **120G** *SC* **120G.3.2** *P* **224** *L* **52** # 126

Ghiasi, Ali — Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **R**

Module ouptut also needs common mode return loss

SuggestedRemedy

RLCC=12-9*f dB, from 10 MHz to 1 GHz
RLCC=3 dB 1 to 53 GHz
See ghiasi_3ck_03_0320

Response *Response Status* **C**

REJECT.

Slide 9 of the following presentation was reviewed by the task force.
http://www.ieee802.org/3/ck/public/20_03/ghiasi_3ck_03a_0320.pdf

There was concern expressed about whether this specification is required and whether the limits are appropriate.

There is no consensus to implement the suggested remedy.

Cl **120G** *SC* **120G.3.3.2.1** *P* **227** *L* **52** # 108

Ghiasi, Ali — Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **A** *jitter profile*

Table reference is TBD

SuggestedRemedy

Replace TBD with table 120F-1

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The comment is referring to this sentence at the end of page 227:
"Random jitter and bounded uncorrelated jitter are added such that the output of the pattern generator approximates the output jitter profile given in Table TBD."

The suggested remedy proposes to point to Table 120F-1 which specifies the transmitter electrical characteristics for C2C (not C2M).

It is not clear which parameters in Table 120F-1 specify the output jitter profile.

Change the sentence to the following:
“Random jitter and bounded uncorrelated jitter are added such that the output of the pattern generator approximates the output jitter profile given by maximum JRMS and maximum J4u, and complies with the even-odd jitter specification in Table 120F-1.”

Cl **120G** *SC* **120G.3.3.2.1** *P* **228** *L* **39** # 10063

Dudek, Mike — Marvell

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

[Comment resubmitted from Draft 1.0. Subcl. 120G.3.3.2.1 - Pg 221 - ln 39]

The draft is missing the information for how to set up the stressed receiver input signal.

SuggestedRemedy

Insert the following (modified from 120E.3.3.2.1) " Random jitter and the pattern generator output levels are adjusted (without exceeding the differential pk-pk input voltage tolerance specification as shown in Table 120G-4) to result in the eye height for all three eyes and eye width for the smallest eye given in Table 120G-5 with the setting of the CTLE that maximizes the product of eye height and eye width.
The far-end pre-cursor ISI ratio is measured using the method defined in 120E.3.2.1.2 and it shall meet the
specification in Table 120G-3. Pre-emphasis capability is likely to be required in the pattern generator to
meet this requirement". However consider whether the product of eye height and eye width is the best criteria or whether it would be better to replace "that maximizes the product of eye height and eye width" with "that minimizes the value of vertical eye closure.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Insert the following:
"Random jitter and the pattern generator output levels are adjusted (without exceeding the differential peak-to-peak input voltage tolerance specification as shown in Table 120G-4) to result in the eye height for all three eyes and eye width for the smallest eye given in Table 120G-5 with the setting of the CTLE that minimizes the value of vertical eye closure.
The far-end pre-cursor ISI ratio is measured using the method defined in 120E.3.2.1.2 and it meets the specification in Table 120G-3. Pre-emphasis capability is likely to be required in the pattern generator to
meet this requirement".

Cl **120G** *SC* **120G.3.4.1.1** *P* **230** *L* **14** # 107

Ghiasi, Ali — Ghiasi Quantum/Inphi

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

Table reference is TBD

SuggestedRemedy

Replace TBD with table 120F-1

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: The line number was changed from 52 to 14.]

The comment relates to the following sentence.

"Random jitter and bounded uncorrelated jitter are added such that the output of the pattern generator approximates the output jitter profile given in Table TBD."

The suggested remedy proposes to point to Table 120F-1 which specifies the transmitter electrical characteristics for C2C (not C2M).

It is not clear which parameters in Table 120F-1 specify the output jitter profile.

See also comment #108.

Change the sentence to:
“Random jitter and bounded uncorrelated jitter are added such that the output of the pattern generator approximates the output jitter profile
given by maximum JRMS and maximum J4u, and complies with the even-odd jitter specification in Table 120F-1.”

Cl **120G** *SC* **120G.3.4.1.1** *P* **231** *L* **9** # 110

Ghiasi, Ali — Ghiasi Quantum/Inphi

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

loss at TP1a is TBD plus two more TBDs on the same line

SuggestedRemedy

..TP1a is 19.2 dB. The 19.2 dB loss represents 16 dB channels loss .

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change text to
"TP1a is 18.2 dB. The 18.2 dB loss represents 16 dB channels loss"

Cl **120G** *SC* **120G.3.4.1.1** *P* **231** *L* **16** # 111

Ghiasi, Ali — Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **R**

CTLE setting for max loss is TBD

SuggestedRemedy

add table of supported CTLE per ghiasi_3ck_01_0320 where includes min g_DC and g_DC_HP, min g_DC=10 dB and min g_DC_HP=2 dB

Response *Response Status* **C**

REJECT.

More analysis is required to show that the constraints are appropriate. There is no consensus to implement the suggested remedy at this time.

Cl **120G** *SC* **120G.3.4.1.1** *P* **231** *L* **22** # 10062

Dudek, Mike — Marvell

Comment Type **T** *Comment Status* **A** *C2M VEC*

[Comment resubmitted from Draft 1.0. Subcl. 120G.3.4.1.1 - Pg 224 - ln 22]

Multiple presentations have shown that the VEC at TP1a is more critical for end to end performance than just the eye opening.

SuggestedRemedy

Add a VEC min specification to Table 120G-8. Value TBD. Move the sentence on line 22 beginnin with "In both cases" to a separate paragraph (to emphasis that it applies to both the high and low loss cases) and change it to "In both cases, the input VEC is less than TBD dB and greater than the value in table 120G-8

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Move the sentence to a new paragraph and change to the following:

"In both the low-loss and high-loss cases, the input VEC is less than 9.5 dB and greater than the value in table 120G-8."

Add a VEC min specification to Table 120G-8 and set the value to 9 dB.

Implement with editorial license.

Cl **120G** *SC* **120G.3.4.1.1** *P* **231** *L* **23** # 112

Ghiasi, Ali — Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **R**

CTLE setting for min loss is TBD

SuggestedRemedy

add table of supported CTLE per ghiasi_3ck_01_0320 where includes min g_DC and g_DC_HP, min g_DC=4 dB and min g_DC_HP=1 dB

Response *Response Status* **C**

REJECT.

More analysis is required to show that the constraints are appropriate. There is no consensus to implement the suggested remedy at this time.

Cl **120G** *SC* **120G.4.2** *P* **232** *L* **15** # 114

Ghiasi, Ali — Ghiasi Quantum/Inphi

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

Is not necessary to allow all combination of gDC and gDC2

SuggestedRemedy

Move gDC and gDC2 into a new table with 3 columns for TP1a, TP4, and TP5 per ghiasi_3ck_01_0320

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the responses to comment #10157 and #143.

Cl **120G** *SC* **120G.4.2** *P* **232** *L* **15** # 10158

Dawe, Piers — Mellanox

Comment Type **TR** *Comment Status* **A** *(IR)*

[Comment resubmitted from Draft 1.0. Subcl. 120G.4.2 - Pg 225 - ln 40]

These look like the CTLE limits for TP1a and TP4 far end.

SuggestedRemedy

Where are the limits for TP4 near end?

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[The proposed change in the comment does not contain sufficient detail to understand the specific changes that satisfy the commenter.]

It is assumed that the comment is referring to the continuous-time filter (CTF) parameters in Table 120G-9.

There is no issue stated in the comment nor any proposed changes in the suggested remedy.

Resolve using the response to comment #143.

Cl **120G** *SC* **120G.4.2** *P* **232** *L* **15** # 143

Dawe, Piers — Mellanox

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

The allowed CTLE settings for TP4 near end are not the same as for TP1a and TP4 far end, and as Ali and I have proposed, should not be simple min/max limits anyway.

SuggestedRemedy

Replace with tables from Ali or me. Also see D1.0 comment 157

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add separate specifications for gDC and gDC2 for TP4 far-end and TP4 near-end with values TBD.

Implement with editorial license.

Cl **120G** *SC* **120G.4.2** *P* **232** *L* **19** # 10157

Dawe, Piers Mellanox

Comment Type **TR** *Comment Status* **A** *RR ctle*

[Comment resubmitted from Draft 1.0. Subcl. 120G.4.2 - Pg 225 - ln 44]

This allows combinations such as gDC=-3, gDC2=-3 that should not happen, receivers don't need to design for, and waste time in the "for each valid combination of gDC and gDC2" measurement procedure.

SuggestedRemedy

Limit the combinations:

gDC2	gDC
0 or 1	3 to 14
2	6 to 14
3	9 to 14

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Based on discussions at the task force meeting the implement following.

For TP1a reference receiver, update the the gDC and gDC2 specifications to allow the following combinations only:

gDC2	gDC
0:	-2 to -9
-1:	-2 to -12
-2:	-4 to -12
-3:	-8 to -13

Cl **120G** *SC* **120G.4.2** *P* **232** *L* **19** # 10143

Dawe, Piers Mellanox

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

[Comment resubmitted from Draft 1.0. Subcl. 120G.4.2 - Pg 225 - ln 46]

Are 1 dB steps for gDC2 fine enough?

SuggestedRemedy

Change to 1/2 dB?

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The comment provides no justification for the changing the step size.

However, discussion at the task force meeting was in favor of making the suggested change.

Change the step size for gDC2 to 0.5 dB.

Cl **120G** *SC* **120G.4.2** *P* **232** *L* **31** # 10145

Dawe, Piers Mellanox

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

[Comment resubmitted from Draft 1.0. Subcl. 120G.4.2 - Pg 226 - ln 10]

We need minimum limits for the C2M normalized DFE coefficient magnitudes. We saw for backplane that the minimum limits should be very different to the maximum limits.

SuggestedRemedy

Add bmin limits.

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **120G** *SC* **120G.4.2** *P* **232** *L* **37** # 137

Dawe, Piers Mellanox

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

This is incomplete: "Capture the signal according the method defined in 162.9.3.1.1", because it throws away the noise and jitter in the signal. This method could be used to find the pulse response, DFE tap weights and sampling phase, but...

SuggestedRemedy

Make it clear that the signal that is used in step e "Compute the receiver input signal yrx(k) by applying the effect of the DFE" is captured acording to 120E but with a different observation filter. Actually, there is one measurement, and the measured signal is processed (e.g. averaged) to obtain the signal of 162.9.3.1.1.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

It is intended that the eye opening measurement includes the effect of noise at the transmitter output.

162.9.3.1.1 references 85.8.3.3.4 "Waveform acquisition" which includes the following statement:
"Averaging multiple waveform captures is recommended."

The methodology further limits the number of samples to the length of the test pattern.

In order to retain the reference to 162.9.3.1.1, one or more exceptions would have to be added for it to be appropriate.

Since this eye opening methodology uses the methods in 120E.4.2 to derive EH, EW, and VEC, it makes sense to use the same or similar capture method.

In order to use the methodology from 120E, some changes are required. Rather than referring to 120E, it is better to include the capture method in 120G.

Procedure step e) is not clear regarding to which signal the effect of the DFE should be applied.

Change the first paragraph in 120G.4.2 and item a) as shown in slide 4 of brown_3ck_04a_0320.

In step e).
Change:
"applying the effect of the DFE using"
To:
"applying the effect of the DFE to *y*2(k) using"

Cl **162A** *SC* **162A.5** *P* **241** *L* **45** # 145

Dawe, Piers Mellanox

Comment Type **T** *Comment Status* **D** *(IR)*

I wonder if there is an inconsistency between the numbers in Table 162A-1 and those in Figure 162A-2. The 0.2 dB "MCB via allowance" could be the cause of the confusion.

SuggestedRemedy

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.