

IEEE P802.3ck D1.0 100/200/400 Gb/s Electrical Interfaces Task Force 1st Task Force review comments

CI 120G SC 120G.3.1 P213 L34 # 72

Wu, Mau-Lin MediaTek

Comment Type T Comment Status D

There are a lot of TBD values in Table 120G-1 - Host output characteristics at TP1a. I prepared one contribution, wu_3ck_02_0120, to address how to settle down on these.

SuggestedRemedy

Proposed to change values in Table 120G-1 according to the contribution, wu_3ck_02_0120.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

The following presentation was reviewed by the task force:
http://www.ieee802.org/3/ck/public/20_01/wu_3ck_02a_0120.pdf

The reviewed presentation makes proposals for VEC pass/fail criteria, EH, and methodology correction.

The resolution to comment #189 provides a value for EH.

The resolution to comment #190 was that there is no consensus to make a change to the VEC pass/fail criteria.

CI 120G SC 120G.3.1 P213 L53 # 56

Dudek, Mike Marvell

Comment Type T Comment Status D VEC

The vertical eye height is TBD

SuggestedRemedy

Adopt the value proposed in Dudek_3ck_01_1119 (7.5dB). A presentation will be made providing more information.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

In the comment, "vertical eye height" should be "vertical eye closure".

The following presentation was reviewed by the task force:
http://www.ieee802.org/3/ck/public/20_01/dudek_3ck_01_0120.pdf

The resolution to comment #190 was that there is no consensus to make a change to the VEC pass/fail criteria.

CI 120G SC 120G.3.1.3 P215 L25 # 59

Dudek, Mike Marvell

Comment Type E Comment Status D C2M ERL

This section labelled Host output effective return loss is referenced by the Module output test, the Host input test and the module input test.

SuggestedRemedy

Either add separate sections for the module output ERL test or broaden the title and text of this section to include the other points. I think it may be better to have two sections one for the Host tests (using the HCB) and one for the Module tests (using the MCB).

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Create a new subclause each for host input, module output, and module input written in the context of the test point, but with the same specifications as in 120G.3.1.3.

CI 120G SC 120G.3.1.3 P215 L28 # 71

Wu, Mau-Lin MediaTek

Comment Type T Comment Status D ERL

In the paragraph of "Host output effective return loss", the sentence of "The value of T_fx is twice the delay associated with the TP1a test fixture being used" is NOT appropriate because the section of 120G.3.1.3 is used not only for Host output ERL, but also Module output ERL, Module input ERL, and Host input ERL. Based on this, the current description is not appropriate.

SuggestedRemedy

The sentence of "The value of T_fx is twice the delay associated with the TP1a test fixture being used" shall be changed as "The value of T_fx is twice the delay associated with the specific test fixture being used."

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Based on Strawpoll #xxx, there are concerns with the current ERL test methodology.

As are result, it is not possible to select values for related parameters with any confidence.

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CI 120G SC 120G.3.1.3 P215 L29 # 57
 Dudek, Mike Marvell
 Comment Type T Comment Status D C2M ERL
 The test fixture delay should be clarified so that the connector is not included in the delay that is removed
 SuggestedRemedy
 Change "associated with the TP1a test fixture" to from the measurement point TP1a to the beginning of the TP1a test fixture MDI connector".
 Proposed Response Response Status W
 PROPOSED ACCEPT IN PRINCIPLE.
 There is no MDI for C2M.
 See comment 71.

CI 120G SC 120G.3.2 P217 L28 # 193
 Ghiasi, Ali Ghiasi Quantum/Inphi
 Comment Type TR Comment Status D C2M vec
 Module output VEC is TBDs and need values
 SuggestedRemedy
 See ghiasi_3ck_03_0120 and
 Near end TP4 VEC = 7.0 dB
 Far end TP5-L1 VEC = 7.5 dB
 Far end TP5-L2 VEC = 7.5 dB
 Proposed Response Response Status W
 PROPOSED ACCEPT IN PRINCIPLE.
 A presentation relating to this comment is anticipated for the January meeting.
 For task force discussion.

CI 120G SC 120G.3.2 P217 L28 # 191
 Ghiasi, Ali Ghiasi Quantum/Inphi
 Comment Type TR Comment Status D
 Need improve test methodology for moule ouptut compliance
 SuggestedRemedy
 See ghiasi_3ck_03_0120
 Proposed Response Response Status W
 PROPOSED REJECT.
 The comment does not identify how the methodology is deficient nor does it provide a remedy.
 A presentation relating to this comment is anticipated for the January meeting.
 For task force discussion.

CI 120G SC 120G.3.2 P217 L28 # 192
 Ghiasi, Ali Ghiasi Quantum/Inphi
 Comment Type TR Comment Status D C2M eye opening
 Module output EH is TBDs and need values
 SuggestedRemedy
 See ghiasi_3ck_03_0120 and
 Near end TP4 EH = 50 mV
 Far end TP5-L1 EH = 32 mV
 Far end TP5-L2 EH= 20 mV
 Proposed Response Response Status W
 PROPOSED ACCEPT IN PRINCIPLE.
 A presentation relating to this comment is anticipated for the January meeting.
 For task force discussion.

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Cl 120G SC 120G.3.2 P217 L50 # 144

Dawe, Piers Mellanox

Comment Type TR Comment Status D

Far-end pre-cursor ISI ratio has not been justified and doesn't fit well with the other C2M specs. Better to choose the reference receiver tap limits wisely.

SuggestedRemedy

Remove the row for far-end pre-cursor ISI ratio from the table.

Proposed Response Response Status W

PROPOSED REJECT.

The commenter has not provided sufficient evidence for the proposed change. However, there was no evidence provided to justify inclusion of this parameter. Given that the specification includes EH and VEC, this might be redundant.

For task force discussion.

Cl 120G SC 120G.3.3 P219 L43 # 60

Dudek, Mike Marvell

Comment Type E Comment Status D C2M ERL

The reference to ERL in table 120G-4 is directly to 120G.3.1.3 but there is a separate section 120G.3.3.1 (but it points directly to 120G.3.1.3 see other comment)

SuggestedRemedy

Either delete section 120G.3.3.1 or change the reference in table 120G-4 to 120G.3.3.1

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

In Table 120G-4, change the reference for ERL to 120G.3.3.1.

Cl 120G SC 120G.3.3.2 P220 L6 # 194

Ghiasi, Ali Ghiasi Quantum/Inphi

Comment Type TR Comment Status D C2M eye opening

Far end eye height is TBD

SuggestedRemedy

Replace TBD with 50 mV

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

See ghiasi_3ck_03_0120.

For task force discussion.

Cl 120G SC 120G.3.3.2.1 P221 L39 # 63

Dudek, Mike Marvell

Comment Type T Comment Status D

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.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Insert the following, with the selected optimization <optimization criteria>:

"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 <optimization criteria>.

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".

For <optimization criteria> select from one of the following:

- (a) "maximizes the product of eye height and eye width"
- (b) "minimizes the value of vertical eye closure"

For task force discussion.

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CI **120G** SC **120G.3.4.1** P**222** L**32** # **195**
 Ghiasi, Ali Ghiasi Quantum/Inphi
 Comment Type **TR** Comment Status **D** C2M eye opening
 Module stress input eye height is TBD
SuggestedRemedy
 Replace TBD with 15 mV @ nominal VEC of 8.5 dB
 Add 2nd test condition 30 mV @ nominal VEC of 11 dB
 Proposed Response Response Status **W**
 PROPOSED ACCEPT IN PRINCIPLE.
 See comment #61.

CI **120G** SC **120G.3.4.1.1** P**224** L**12** # **61**
 Dudek, Mike Marvell
 Comment Type **T** Comment Status **D** C2M eye opening
 The sections referenced for measuring Eye height and VEC don't have the correct reference receiver and section 4.2 has more details about how to measure these.
SuggestedRemedy
 Change "Eye height and VEC are then measured at TP1a based on the measurement methodology given in 120E.4.2 and vertical eye closure is measured according to 120E.4.3." to Eye height and VEC are then measured at TP1a as described in 120G.4.2 "
 Proposed Response Response Status **W**
 PROPOSED ACCEPT.

CI **120G** SC **120G.3.4.1.1** P**224** L**22** # **62**
 Dudek, Mike Marvell
 Comment Type **T** Comment Status **D** C2M VEC
 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
 Proposed Response Response Status **W**
 PROPOSED 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 TBD dB and greater than the value in table 120G-8."
 The TBD value might be chosen if the value in Table 120G-8 is also chosen.
 For task force discussion.

CI **120G** SC **120G.4.2** P**225** L**28** # **273**
 Hidaka, Yasuo Credo Semiconductor
 Comment Type **TR** Comment Status **D** C2M VEC
 Our study showed that VEC (vertical eye closure) is not a good performance metric of whole link performance, if we take account of receiver impairments. This is partly because VEC is not a function of channel insertion loss. EVEC (effective vertical eye closure) as proposed in sun_3ck_02_1119.pdf (page 3) is a better alternative, because it takes account of EH (eye height) as an indicator of channel insertion loss.
SuggestedRemedy
 Replace "Vertical eye closure (max)" in Table 120G-1 with "Effective vertical eye closure (max)".
 Add a sub section to define effective vertical eye closure.
 A presentation of a detail proposal will be given at the January meeting.
 Proposed Response Response Status **W**
 PROPOSED ACCEPT IN PRINCIPLE.
 The task force reviewed the following presentation:
http://www.ieee802.org/3/ck/public/20_01/sun_3ck_01a_0120.pdf
 The resolution to comment #190 was that there is no consensus to make a change to the VEC pass/fail criteria.

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CI 120G SC 120G.4.2 P225 L40 # 158

Dawe, Piers Mellanox

Comment Type TR Comment Status D

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

SuggestedRemedy

Where are the limits for TP4 near end?

Proposed Response Response Status W

PROPOSED REJECT.

It is assumed that the commenter 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.

The CTF parameters specified in this Table 120G-9 are for either case.

CI 120G SC 120G.4.2 P225 L44 # 157

Dawe, Piers Mellanox

Comment Type TR Comment Status D

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

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

For task force discussion.

CI 120G SC 120G.4.2 P225 L46 # 143

Dawe, Piers Mellanox

Comment Type T Comment Status D

Are 1 dB steps for gDC2 fine enough?

SuggestedRemedy

Change to 1/2 dB?

Proposed Response Response Status W

PROPOSED REJECT.

There is no justification provided for the proposed changed.

CI 120G SC 120G.4.2 P226 L10 # 145

Dawe, Piers Mellanox

Comment Type TR Comment Status D

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 W

PROPOSED REJECT.

The parameter b_max(n) defines the "magnitude" of the coefficient and thus the minimum value is already specified has -b_max(n). See Equation 93A-26.

The suggested remedy provides no recommendation for alternate bmin values.

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Cl 120G SC 120G.4.2 P226 L11 # 155

Dawe, Piers Mellanox

Comment Type TR Comment Status D

In the same way that COM has eta0, this measurement should have a standardised "added" noise to represent noise that a product might have but the measurement doesn't, so that the reference receiver is not better than a range of real receiver implementations. This can be a constant in mV or V²/GHz. Further, it needs a second noise term to account for reflections that a product might have but the measurement doesn't. This is proportional to the signal, so can be a set ratio to sum(AVupp + AVmid + AVlow).

SuggestedRemedy

Include two noise items in the measurement, one a constant in mV or V²/GHz, the other a set ratio to sum(AVupp + AVmid + AVlow). To be RSSd with the measured, equalised signal. Allow RSSing out the scope noise (as done in TDECQ) if it's significant.

Proposed Response Response Status W

PROPOSED REJECT.

The commenter has not provided justification for the proposed specification methodology, e.g., improvement in accuracy, actual expected values, etc. relating to the proposed methodology.

Cl 120G SC 120G.4.2 P226 L13 # 156

Dawe, Piers Mellanox

Comment Type TR Comment Status D

This recipe is a weird combination of the existing C2M measurement method and COM, which is a simulation not a measurement method, for channels not signals, and for backplanes with transmitter training not low power C2M.

SuggestedRemedy

Unless someone can show that it works, change to the CTLE/FFE method as in OIF CEI-112G-VSR.

Proposed Response Response Status W

PROPOSED REJECT.

The methodology specified is consistent with the adopted baseline (DFE not FFE).

The commenter does not provide evidence that the method is insufficient such that the alternate method in the suggested remedy is required.

Cl 120G SC 120G.4.2 P226 L24 # 166

Li, Mike Intel

Comment Type TR Comment Status D

"Np equal to 200" is not appropriate as UI becomes half in second.

SuggestedRemedy

"Np equal to 200" to "Np equal to 400"

Proposed Response Response Status W

PROPOSED REJECT.

The linear pulse fit is intended for determining the DFE sampling phase position. As such, the extra precision potentially gained by the larger Np value likely is not necessary. In fact, it may be possible to reduce the value without impact.

Further evidence is required to determine if any changes are needed.

For task force discussion.

See comment 165.

Cl 120G SC 120G.4.2 P226 L24 # 165

Li, Mike Intel

Comment Type TR Comment Status D

"Dp equal to 3" is not right as there are 3 pre-taps for the host

SuggestedRemedy

change "Dp equal to 3" to ""Dp equal to 4".

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Host and module transmitter equalization architecture is not specified so there is no need to match the parameters in that regard.

The linear fit pulse response is intended only for determining the DFE sampling phase position. As such, the extra precision potentially gained by the larger Dp value may not be necessary.

On the other hand, since the measured data is filtered with any of the compliant CTLE settings applied, a larger value may be required for some CTLE settings.

Further evidence is required to determine if any changes are needed.

For task force discussion.

See comment 166.

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CI 120G SC 120G.4.2 P226 L28 # 274

Hidaka, Yasuo

Credo Semiconductor

Comment Type TR Comment Status D

In the performance study at TP1a in sun_3ck_02_1119.pdf, eta_0 noise of 8.20E-9 V²/GHz was added at the CTLE input. However, eta_0 noise is not added in the reference receiver described in 120G.4.2. If we do not add the eta_0 noise in the reference receiver in the scope, measured eye opening will be larger than the performance study. This will create a hole in the specification.

An easy fix is to add eta_0 noise in the reference receiver.

Another option is to re-do the performance study without eta_0 noise in the reference receiver in order to estimate the performance accurately, but it will take time. I recommend to add eta_0 noise in the reference receiver for now. We can remove it later, after we finish re-doing the performance study without eta_0 noise in the reference receiver.

SuggestedRemedy

Add eta_0 noise of 8.20E-9 V²/GHz to table 120G-9.

Add a step to add eta_0 noise after step b in page 226.

Here, eta_0 noise is a gaussian noise consistent with the third term of (93A-41).

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

For task force discussion.

See comment #155.

CI 120G SC 120G.4.2 P226 L33 # 167

Li, Mike

Intel

Comment Type TR Comment Status D

"Within the set of combinations of gDC and gDC2 with eye height meeting the target requirement, for the combination resulting in the smallest vertical eye closure, the eye height, eye width, and vertical eye closure are used as the measured values.", VEC alone will not be a good FOM for optimization, it needs to be the combination of VEC and EH, which is EVEC. Further, the clarity of the whole sentences is not good.

SuggestedRemedy

change the whole sentence to: "Within the set of combinations of gDC and gDC2, the eye height, eye width, and vertical eye closure, resulting in the smallest effective vertical eye closure, are used as the measured values."

Proposed Response Response Status W

PROPOSED REJECT.

The criteria as written is intended to result in a single (e.g., greater than 0, less than 2) candidates.

The commenter makes reference to a parameter EVEC but does not define it.

CI 120G SC 120G.4.2 P226 L33 # 66

Dudek, Mike

Marvell

Comment Type E Comment Status D

The paragraph describing what the measured values of Eye height, Eye width and VEC are is difficult to follow.

SuggestedRemedy

Consider replacing this paragraph with "The measured values of eye height, eye width and vertical eye closure are the values obtained with the combination of gDC and gDC2 that produces an eye height above the target value and the minimum value of vertical eye closure.

Proposed Response Response Status W

PROPOSED REJECT.

The criteria at the end of the proposed text might result in candidates for multiple parameter combinations. The criteria as written is intended to result in a single (i.e., greater than 0, less than 2) candidates.

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Cl **120G** SC **120G.4.2** P**226** L**40** # **197**

Ghiasi, Ali

Ghiasi Quantum/Inphi

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

gDC max gain of 14 dB is unnecessary with a DFE receiver and channel <=16 dB

SuggestedRemedy

12 dB would be more than adequate and with further study we can even further reduce the gDC.

Proposed Response Response Status **W**

PROPOSED REJECT.

The commenter provides no evidence that the current specification is incorrect.

For task force discussion.

Cl **120G** SC **120G.4.2** P**226** L**40** # **199**

Ghiasi, Ali

Ghiasi Quantum/Inphi

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

To speed up testing and eliminating weird cases one should gDC/gDC2 combinations

SuggestedRemedy

See ghiasi_3ck_03_0120 for table of allowed CTLE combinations.

Proposed Response Response Status **W**

PROPOSED ACCEPT IN PRINCIPLE.

A presentation relating to this comment is anticipated at the January meeting.

For task force discussion.

Cl **162** SC **162.8.11** P**138** L**32** # **247**

Ran, Adeel

Intel

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

The PMD control function as currently specified is only effective during start up.

Operation across a wide range of temperatures in some environments may cause slow changes in channel and device characteristics that may require occasional changes of the Tx equalization, preferably without link flaps. It would be good to enable doing it while the link is up.

In Data mode, the startup (training) protocol is inactive. We can specify that when `mr_training_en` set to 0, instead of exchanging the control and status fields through the protocol, these fields will be written to and read from management registers if MDIO is implemented. Management can relay the control and status fields to/from the link partner through higher level messaging (such as LLDP).

A detailed proposal is planned, but the requested addition in the PMD clauses is a subclause for behavior of the PMD control function when training is false (data mode).

SuggestedRemedy

Add the following paragraphs:

When the training variable is set to false (see 136.8.11.7.1), the PMD control function may optionally continue using Equalization control as defined 136.8.11.4 in the SEND_DATA state, using MDIO registers or alternative methods to exchange control and status fields with the link partner instead of the training frame specified in 136.8.11.1.

NOTE--When training is false, any update to variables corresponding to a change of the Modulation and precoding request bits or the Initial condition request bits, or to setting the Coefficient request bits to "No equalization", can be disruptive to a network.

Proposed Response Response Status **W**

PROPOSED REJECT.

Comment alludes to a future proposal. Propose deferring discussion of this topic until the proposal is presented. Request that commenter use the ad hoc for this purpose.

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CI 162 SC 162.9.3 P139 L27 # 3
 Mellitz, Richard Samtec
 Comment Type TR Comment Status D ERL
 ERL of 11 dB seems to capture most of posted channel data.
 SuggestedRemedy
 In table 162-8 change ERL(min) to 11 dB as suggested on slide 5 of mellitz_3ck_04_1119.
 Proposed Response Response Status W
 PROPOSED ACCEPT IN PRINCIPLE.
 For task for discussion.

CI 162 SC 162.9.3 P140 L10 # 249
 Ran, Adee Intel
 Comment Type T Comment Status D
 The maximum step size of 2% for a PAM4 equalizer creates a significant increase in complexity for a DAC-based transmitter implementation, compared to the step size allowed in the 802.3cd specs.
 A PAM4 DAC with the 2.5% specification in 802.3cd is required to be able of outputting 6/0.025=240 possible values, while with a 2% step size it requires 6/0.02=300 possible values. This means an additional bit should be used in the logic implementing the FFE and DAC control, and the analog circuits should enable more combinations.
 The estimated cost in power consumption of the FFE+DAC logic and analog circuits from this small change in resolution, with a non-naive design, is about 0.3-0.4 pJ/bit. This additional power is going to be consumed regardless of the channel in question.
 The benefit from this finer resolution has not been analyzed thoroughly enough to justify such an increase in implementation burden and power consumption.

SuggestedRemedy
 Change the (max.) values for c(-3) to c(0) to 0.024 (which can be met with a DAC capable of 256 output values).
 Proposed Response Response Status W
 PROPOSED REJECT.
 All analysis to date has used 2% step size. The commenter proposes increasing step size to 2.5% but does not provide evidence that it does not adversely affect the performance of contributed channels.

CI 162 SC 162.9.3 P140 L24 # 252
 Ran, Adee Intel
 Comment Type T Comment Status D
 Maximum for even-odd jitter is specified here. This is mainly required for transmitters which are driven by a half-rate clock.
 For >53.1 GBd signaling, a >26.3 GHz clock is needed to drive the transmitter clock in half-rate. This is a high frequency for current CMOS processes and implementations with quarter-rate clocking (13.3 GHz clock) should be considered.
 With quarter-rate signaling, even if the even-odd jitter (mismatches between phases 0:2 and between 1:3) is controlled to meet the specifications, the quadrature jitter (mismatches between phases 0:1 and between 2:3) can be large, and the current even-odd jitter measurements do not cover this impairment.

We need to limit quadrature jitter so a similar portion of the UI.
 New specification for quadrature jitter will be provided in future contributions. I assume it will be similar to the EOJ measurement with slight modifications. For the time being the measurement method can be left as TBD.

SuggestedRemedy
 Add a line for "Quadrature jitter, Pk-Pk", with subclause reference TBD, and value 0.019 UI.
 Proposed Response Response Status W
 PROPOSED REJECT.
 Commenter proposes a new parameter that has not been discussed previously. A methodology and definition has not been provided.
 For task force discussion.

CI 162 SC 162.9.3.4 P144 L26 # 9
 Mellitz, Richard Samtec
 Comment Type TR Comment Status D ERL
 The relation between Pmax/Vf and ERL has not been established for this data rate
 SuggestedRemedy
 Change line 36 to ERL >= 11 dB. Change TBD parameters in table 162-10 beta_x, rho_x, N, and N_bx to 2.4 GHz, 0.3, 1000 UI, and 12 UI respectively as suggested on slide 6 of mellitz_3ck_04_1119.
 Proposed Response Response Status W
 PROPOSED ACCEPT IN PRINCIPLE.
 For task force discussion.

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Cl 162 SC 162.9.4 P145 L15 # 10
 Mellitz, Richard Samtec
 Comment Type **TR** Comment Status **D** ERL
 ERL of 11 dB seems to capture most of posted channel data as suggested in slide 5
 mellitz_3ck_04_1119
SuggestedRemedy
 Change ERL min to 11 dB
Proposed Response Response Status **W**
 PROPOSED ACCEPT IN PRINCIPLE.
 For task force discussion.

Cl 162 SC 162.9.4.5 P148 L48 # 11
 Mellitz, Richard Samtec
 Comment Type **TR** Comment Status **D** ERL
 ERL of 11 dB seems to capture most of posted channel data as suggested in slide 5
 mellitz_3ck_04_1119
SuggestedRemedy
 Change to "Receiver ERL at TP3 shall be greater than or equal to 11dB"
Proposed Response Response Status **W**
 PROPOSED ACCEPT IN PRINCIPLE.
 For task force discussion.

Cl 162 SC 162.11.2 P150 L3 # 79
 Palkert, Tom Molex
 Comment Type **T** Comment Status **D**
 Differential to common-mode return loss, Differential to common mode conversion loss and
 Common-mode to common-mode return loss are not required if ERL and COM are used to
 specify Cable Assembly characteristics.
SuggestedRemedy
 Delete Differential to common-mode return loss, Differential to common mode conversion
 loss and Common-mode to common-mode return loss from Table 162-13 (Cable assembly
 characteristics summary)
Proposed Response Response Status **W**
 PROPOSED REJECT.

The cable assembly Channel Operating Margin (COM) for each lane is derived from
 measurements of the cable assembly signal, near-end crosstalk and far-end crosstalk
 paths. COM is computed using the path calculations defined in 162.11.7.1 and the
 procedure in 93A.1.

The cable assembly signal and crosstalk paths are impacted by the parameters requested
 to be removed. We have an explicit bound on these parameters with the expectation that a
 cable assembly meeting ERL, IL, and these specification parameters will pass COM i.e.,
 cable assembly specification parameters independent of COM. At least one benefit of the
 specification parameters is to enable characterization of the cable assembly by direct
 measurement.

For task force discussion.

IEEE P802.3ck D1.0 100/200/400 Gb/s Electrical Interfaces Task Force 1st Task Force review comments

CI 162 SC 162.11.2 P150 L6 # 276

DiMinico, Christopher

MC Communications

Comment Type T Comment Status D Late

Comment#2

Min Cable/PCB calculation for 802.3cd assumed linear scaling for cable and PCBs. Use same Cable/PCB IL assumptions for Max/Min Cable Assembly.

Table 162-13—Cable assembly characteristics summary [Minimum insertion loss at 26.56 GHz 162.11.2 11.09 dB]

Table 162A-1—Insertion loss budget values at 26.56 GHz [ILcamin 11.09 dB]

SuggestedRemedy

See diminico_3ck_2_0220.pdf.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Use ILchmin and ILcamin versus ILch0.5m and ILca0.5m equation 162A-2 and Table162A-1.

Change values In Table 162-13—Cable assembly characteristics summary [Minimum insertion loss at 26.56GHz 162.11.2 change 11.09 dB to 13 dB. In Table 162A-1—Insertion loss budget values at 26.56 GHz [ILcamin change 11.09 dB to 13 dB. See diminico_3ck_2_0220.pdf

CI 162 SC 162.11.3 P150 L8 # 13

Mellitz, Richard

Samtec

Comment Type TR Comment Status D ERL

ERL of 13.5 dB seems to capture most of posted channel data as suggested in slide 3 mellitz_3ck_04_1119

SuggestedRemedy

Change Minimum cable assembly ERL to 13.5 dB in table 162-13.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Resolve with comment #12

CI 162 SC 162.11.3 P150 L39 # 12

Mellitz, Richard

Samtec

Comment Type TR Comment Status D ERL

ERL of 13.5 dB seems to capture most of posted channel data as suggested in slide 3 mellitz_3ck_04_1119

SuggestedRemedy

Change line 39 to Cable assembly ERL at TP1 and at TP4 shall be greater than or equal to 13.5 dB for cable assemblies that have a COM less than 4 dB. Also change TBD parameters in table 162-14 beta_x, rho_x, N, and N_bx to 2.4 GHz, 0.21, 3000 UI, and 12 UI respectively as suggested on slide 4 of mellitz_3ck_04_1119.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

A presentation (mellitz_3ck_04_1119) relating to this comment is anticipated at the January meeting.

For task force discussion.

CI 162 SC 162.11.7 P152 L33 # 14

Mellitz, Richard

Samtec

Comment Type TR Comment Status D

To move forwards a value for SNR_Tx needs to be chosen

SuggestedRemedy

Replace TBD with 32 dB as in slide 8 of mellitz_3ck_03_1119, slide 9 of lim_3ck_01_1119 in Table 162-15.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Presentations (mellitz_3ck_03_1119 and lim_3ck_01_1119) relating to this comment are anticipated at the January meeting.

For task force discussion.

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CI 162 SC 162.11.7 P152 L45 # 151
 Dawe, Piers Mellanox
 Comment Type TR Comment Status D
 40 UI span was chosen to fit data on backplane channels, and is excessive even for them. Cable channels are smoother. Very short low loss cables should pass easily anyway.
 SuggestedRemedy
 Change 40 to an appropriate number, e.g. 24.
 Proposed Response Response Status W
 PROPOSED REJECT.
 The commenter has not provided sufficient evidence for the proposed change.
 For task force discussion.

CI 162 SC 162.11.7.1 P153 L28 # 16
 Mellitz, Richard Samtec
 Comment Type TR Comment Status D
 Fill in Zp TBD's with data from slide 8 of benartsi_3ck_01a_0719.
 SuggestedRemedy
 Change Line 28ff to Equation (93A-13) and Equation (93A-14) using $z_p = 110.3$ mm in length and the parameter values given in {new table}, with the exception that Z_c is 100 Ω , representing an insertion loss of 4.33 dB at 26.56 GHz on each PCB
 Proposed Response Response Status W
 PROPOSED ACCEPT IN PRINCIPLE.
 Implement suggested remedy with editorial license.

CI 162 SC 162.11.7.1 P153 L28 # 17
 Mellitz, Richard Samtec
 Comment Type TR Comment Status D
 add {new table for 93A transmission line with data from slide 8 of benartsi_3ck_01a_0719.
 SuggestedRemedy
 $\gamma_0, a_1, a_2 = [0.38206e-04 \ 9.5909e-05]$; $\tau = 5.790E-03$ ns/mm
 Proposed Response Response Status W
 PROPOSED ACCEPT IN PRINCIPLE.
 Implement suggested remedy with editorial license.

CI 162 SC 162.11.7.1.2 P153 L51 # 18
 Mellitz, Richard Samtec
 Comment Type TR Comment Status D
 Fill in TBD's with data from slide 8 of benartsi_3ck_01a_0719.
 SuggestedRemedy
 use same data as for signal path
 Proposed Response Response Status W
 PROPOSED ACCEPT IN PRINCIPLE.
 [Editor's note: Changed subclause from 162.11.7.2 to 162.11.7.1.2]

CI 162B SC 162B.1.3 P235 L24 # 277
 DiMinico, Christopher MC Communications
 Comment Type TR Comment Status D Late
 Annex 162B 162B.1.3 Mated test fixtures
 Provide values for TBDs;
 162B.1.3.1 Mated test fixtures differential insertion loss Equation (162B-3) and Equation (162B-5).
 162B.1.3.3 Mated test fixtures common-mode conversion insertion loss Equation (162B-9).
 162B.1.3.5 Mated test fixtures common-mode to differential mode return loss Equation (162B-10).
 SuggestedRemedy
 See diminico_3ck_1_0220.pdf.
 Proposed Response Response Status W
 PROPOSED ACCEPT IN PRINCIPLE.
 See diminico_3ck_1_0220.pdf.
 Slide 6: 162B.1.3.1 Mated test fixtures differential insertion loss Equation (162B-3) and Equation (162B-5). Slide 9: 162B.1.3.3 Mated test fixtures common-mode conversion insertion loss Equation (162B-9). Slide 8: 162B.1.3.5 Mated test fixtures common-mode to differential mode return loss Equation (162B-10).
 Consider with ghiasi_3ck_01_0120.

IEEE P802.3ck D1.0 100/200/400 Gb/s Electrical Interfaces Task Force 1st Task Force review comments

Cl 163 SC 163.9.2.1 P171 L5 # 69

Wu, Mau-Lin

MediaTek

Comment Type T Comment Status D ERL

Current ERL calculation doesn't consider DFE "floating-tap". The concern is the ERL is very sensitive across "N_bx" boundary as raised in wu_3ck_02a_1119. We need to enhance ERL calculation methodology.

SuggestedRemedy

Modify ERL as capable of DFE floating tap as proposed in wu_3ck_01_0120. The same methodology shall be applied to CR TX, CR RX, KR TX, & KR RX ERL calculations in the following subclauses.

162.9.3.4 Transmitter effective return loss (ERL) 162.9.4.5 Receiver ERL

163.9.2.1 Transmitter ERL

163.9.3 Receiver characteristics

Proposed Response Response Status W

PROPOSED REJECT.

This topic has been discussed at an ad hoc and there appeared to be no consensus for the proposed change.

A presentation related to this comment is anticipated at the January meeting.

For task force discussion

Cl 163 SC 163.9.2.1 P171 L5 # 20

Mellitz, Richard

Samtec

Comment Type TR Comment Status D ERL

Nbx=Nb has been shown not correlate well to COM in mellitz_3ck_adhoc_02_100219.

Nbx=24 seems to be a better choice

SuggestedRemedy

Change "Nbx is set to the value of Nb in Table 163-10" to "Nbx is set to 24 UI"

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

For task force discussion.

http://www.ieee802.org/3/ck/public/20_01/mellitz_3ck_01a_0120.pdf

Cl 163 SC 163.9.2.1 P171 L10 # 21

Mellitz, Richard

Samtec

Comment Type TR Comment Status D ERL

Table 163-3 was developed for a different data rate and reference package assumption. Recommendation were proposed in mellitz_3ck_01_1119 slide 7.

SuggestedRemedy

In Table 163-3 set: beta_x=2.4 GHz , rho_x=.3

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

For task force discussion.

http://www.ieee802.org/3/ck/public/20_01/mellitz_3ck_01a_0120.pdf

Cl 163 SC 163.9.3.1 P171 L44 # 22

Mellitz, Richard

Samtec

Comment Type TR Comment Status D ERL

Nbx=Nb has been shown not correlate well to COM in mellitz_3ck_adhoc_02_100219.

Nbx=24 seems to be a better choice

SuggestedRemedy

Change "Nbx is set to the value of Nb in Table 163-10" to "Nbx is set to 24 UI"

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

For task force discussion.

Cl 163 SC 163.10.2 P177 L13 # 24

Mellitz, Richard

Samtec

Comment Type TR Comment Status D ERL

Table 163-11 was developed for a different data rate and reference package assumption. Recommendation were proposed in mellitz_3ck_01_1119 slide 5.

SuggestedRemedy

In Table 163-11 set: beta_x=2.4 GHz , rho_x=.19

Proposed Response Response Status W

PROPOSED ACCEPT.