Cl **FM** *SC* **FM** *P* **1** *L* **8** # 260

Dawe, Piers Nvidia

Comment Type **E** *Comment Status* **A** *(bucket1)*

Draft Standard for Ethernet
Amendment:
Standard for Ethernet Amendment:
repetition?

SuggestedRemedy

Draft standard for Ethernet
Amendment:
or
Standard for Ethernet
Draft amendment:
Also on page 29.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change:
"Draft Standard for Ethernet
Amendment:
Standard for Ethernet Amendment:"
To:
"Draft Standard for Ethernet
Amendment:"

Cl **FM** *SC* **FM** *P* **10** *L* **1** # 261

Dawe, Piers Nvidia

Comment Type **E** *Comment Status* **A** *(bucket1)*

XX Month 201X

SuggestedRemedy

XX Month 202X

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

To be consistent with formatting elsewhere…
Change "201X" to "20XX".

Cl **FM** *SC* **FM** *P* **21** *L* **16** # 262

Dawe, Piers Nvidia

Comment Type **E** *Comment Status* **A** *(bucket1)*

Italics

SuggestedRemedy

Should be upright as usual?

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Page number updated from 20.]
The font in several lines in the TOC are italic rather than normal.
Fix the fonts in the TOC.

Cl **1** *SC* **1.1.3.2** *P* **30** *L* **21** # 263

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **A** *AUI definition (bucket1)*

These paragraphs about 100GAUI-n, 200GAUI-n and 400GAUI-n are written as if each is a single interface, as in "conformance with implementation of **this interface** ... is recommended, since it allows maximum flexibility" when there are multiple variants, which are not interoperable. Some of these errors should be fixed in maintenance but this project should not be adding new ones.

SuggestedRemedy

Change "and a one-lane version (100GAUI-1)" to "and two one-lane versions (100GAUI-1),".
Change "and a two-lane version (200GAUI-2)" to "and two two-lane versions (200GAUI-2),".
Change "and a four-lane version (400GAUI-4)" to "and two four-lane versions (400GAUI-4),".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Make it clear that C2C and C2M interfaces are uniquely specified. With appropriate editorial mark-ups implement the following…
Change: "Four widths of CAUI-n/100GAUI-n are defined"
To: "For each of chip-to-chip and chip-to-module interfaces, four widths of CAUI-n/100GAUI-n are defined"
Change: "Three widths of 200GAUI-n are defined"
To: "For each of chip-to-chip and chip-to-module interfaces, three widths of 200GAUI-n are defined"
Change: "Three widths of 400GAUI-n are defined"
To: "For each of chip-to-chip and chip-to-module interfaces, three widths of 400GAUI-n are defined"

Cl **1** *SC* **1.3** *P* **31** *L* **14** # 264

Dawe, Piers Nvidia

Comment Type **E** *Comment Status* **A** *(bucket1)*

The base document subclause 1.3 already has an entry for SFF-8665, Rev 1.9, June 29, 2015

SuggestedRemedy

Delete this duplicate

Response *Response Status* **C**

ACCEPT.

Cl **1** *SC* **1.4.36** *P* **32** *L* **1** # 265

Dawe, Piers Nvidia

Comment Type **E** *Comment Status* **A** *(bucket1)*

1.4.36 isn't inserted by 802.3cd, it's in the base document

SuggestedRemedy

Change "as inserted" to "as modified"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The comment correctly points out that the text was not inserted by 802.3cd. The correct term is "changed" rather than "modified".
Change "as inserted by" to "as changed by".

Cl **1** *SC* **1.4.36** *P* **32** *L* **6** # 266

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **A** *AUI definition (bucket1)*

This says that there is one version of 100GAUI-1 when in fact there are two incompatible ones.

SuggestedRemedy

Change "and a single-lane version (100GAUI-1)" to "and two single-lane versions (100GAUI-1)".
Change "Clause 135, Annex 120F, and Annex 120G for 100GAUI-1." to "Clause 135 and Annex 120F or Annex 120G for 100GAUI-1.".
The (See this for this, that for that...) section is becoming unwieldy: it could be better as separate sentences: For 100GAUI-1, see Clause 135 and Annex 120F or Annex 120G.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Make it clear that C2C and C2M interfaces are uniquely specified. With appropriate editorial mark-ups implement the following…
Change: "Four widths are defined"
To: "For each of chip-to-module and chip-to-chip interconnections, four widths are defined"
The portion listing the related clauses is sufficiently clear as written. However, an editorial mark-up is missing.

Cl **1** *SC* **1.4.36** *P* **32** *L* **8** # 267

Dawe, Piers Nvidia

Comment Type **E** *Comment Status* **R** *AUI definition (bucket1)*

Why is PMA clause 135 listed but not 83 or 120 in similar text?

SuggestedRemedy

?

Response *Response Status* **C**

REJECT.

This comment is written as a question and provides no actionable remedy.
Clause 135 is included for 100GAUI-4, 100GAUI-2, and 100GAUI-1 since some aspect of usage are specified in Clause 135.
Addressing references for CAUI-4 and CAUI-10 are outside the scope of this task force.
No changes to the draft are required.

Cl **1** *SC* **1.4.87** *P* **32** *L* **33** # 212

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **A** *AUI definition (bucket1)*

This says that there is one version of 200GAUI-2 when in fact there are two incompatible ones. Notice that 116.1 and 120.5.1 say "Annex 120F *or* Annex 120G".

SuggestedRemedy

Change "and a two-lane version (200GAUI-2)" to "and two two-lane versions (200GAUI-2)".
Change ", or Annex 120F and Annex 120G for 200GAUI-2." to ", or Annex 120F or Annex 120G for 200GAUI-2.".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Make it clear that C2C and C2M interfaces are uniquely specified. With appropriate editorial mark-ups implement the following…
Change: "Three widths of 200GAUI-n are defined"
To: "For each of chip-to-module and chip-to-chip interconnections, three widths of 200GAUI-n are defined"
The portion listing the related clauses is sufficiently clear as written. However, an editorial mark-up is missing.
Add strike-through to "or " before "Annex 120D".

Cl **1** *SC* **1.4.111** *P* **33** *L* **6** # 213

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **A** *AUI definition (bucket1)*

This says that there is one version of 400GAUI-4 when in fact there are two incompatible ones. Notice that 116.1 and 120.5.1 say "Annex 120D, Annex 120E, Annex 120F, *or* Annex 120G".

SuggestedRemedy

Change "and a four-lane version (400GAUI-4)" to "and two four-lane versions (400GAUI-4)".
Change ", or Annex 120F and Annex 120G for 400GAUI-4." to ", or Annex 120F or Annex 120G for 400GAUI-4.".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Make it clear that C2C and C2M interfaces are uniquely specified. With appropriate editorial mark-ups implement the following…
Change: "Three widths of 400GAUI-n are defined"
To: "For each of chip-to-module and chip-to-chip interconnections, three widths of 400GAUI-n are defined"
The portion listing the related clauses does not improve the accuracy or clarity of the specification.

Cl **45** *SC* **45.2.1.135a** *P* **54** *L* **11** # 43

Slavick, Jeff Broadcom

Comment Type **TR** *Comment Status* **A** *(bucket1)*

We've added a footnote stating that the new PRESETs are PHY dependent support, so is C(-3).

SuggestedRemedy

Add a footnote to Tables 45-103a, 45-103b, 45-103c and 45-104d attached to the Coefficient Select and Coefficient Select Echo text stating "Support for a given coefficient is PHY dependent."

Response *Response Status* **C**

ACCEPT.

Cl **73** *SC* **73.6** *P* **66** *L* **15** # 214

Dawe, Piers Nvidia

Comment Type **E** *Comment Status* **A** *(bucket1)*

It's hard to tell what's going on here.

SuggestedRemedy

Please show or tell the reviewers and the staff editor how this figure differs from the existing figure.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change editing instruction to "Replace Figure 73–6 with the following figure to make D43 indicate F4 rather than A22."
Underneath Figure 73-6 insert new editing instruction
"Change the last two sentences of the final paragraph of 73.6 as follows:"
Include text to show modification of last two sentences of 73.6 so that it will read as follows:
"D[42:21] contains the Technology Ability Field. D[47:43] contains FEC capability (see 73.6.5)."
Implement with editorial license.

Cl **93A** *SC* **93A.1** *P* **195** *L* **24** # 27

Healey, Adam Broadcom Inc.

Comment Type **E** *Comment Status* **A** *description*

What is a "pad" in this context and does the description really fit this parameter? Note that this change to the parameter name, should it persist, should be propagated to every COM parameter table in IEEE Std 802.3 and not just the ones created or modified by this amendment. This does not seem worthwhile since the change to the name does not add any descriptive value.

SuggestedRemedy

Remove "pad" from the description of this parameter (i.e., undo the change). Update Tables 162-18, 163-11, and 120F-7 accordingly.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement the suggested remedy. Also change "single-ended device bump capacitance" to "single-ended bump capacitance".

[Editor's note: CC: 162, 163, 120F]

Cl **93A** *SC* **93A.1** *P* **195** *L* **24** # 28

Healey, Adam Broadcom Inc.

Comment Type **E** *Comment Status* **A** *(bucket1)*

93A.1.2 exists in this document.

SuggestedRemedy

Add a cross-reference link.

Response *Response Status* **C**

ACCEPT.

Cl **93A** *SC* **93A.1.2.1** *P* **198** *L* **3** # 233

Dawe, Piers Nvidia

Comment Type **T** *Comment Status* **R** *cascade*

Do we need to consider cascading 4-port networks?

SuggestedRemedy

Response *Response Status* **C**

REJECT.

The comment is in the form of a question and there is not remedy provided.

Cl **93A** *SC* **93A.1.2.1** *P* **198** *L* **10** # 234

Dawe, Piers Nvidia

Comment Type **T** *Comment Status* **R** *cascade*

It may be helpful to the reader (particularly someone programming this function) to know that cascade() is associative.

SuggestedRemedy

Add a sentence:
cascade is associative: cascade(S(w), cascade(S(x), S(y))) = cascade(cascade(S(w), S(x)), S(y)).

Response *Response Status* **C**

REJECT.

Although the forms shown in the suggested remedy are valid, they can be deduced from equations already provided.

Cl **93A** *SC* **93A.1.2.2** *P* **198** *L* **14** # 235

Dawe, Piers Nvidia

Comment Type **E** *Comment Status* **A** *(bucket1)*

Network

SuggestedRemedy

network (as in the published base document). Also in 93A.1.2.3

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change "Network" to "network".

Cl **93A** *SC* **93A.1.2.3** *P* **199** *L* **14** # 53

Ran, Adee Intel

Comment Type **T** *Comment Status* **A** *equation (bucket1)*

Equation 93A-12A has a typo - denominator should be a sum (as in equation 93A-12).

SuggestedRemedy

Change "-" to "+" in the denominator.

Response *Response Status* **C**

ACCEPT.

Cl **93A** *SC* **93A.5** *P* **202** *L* **26** # 236

Dawe, Piers Nvidia

Comment Type **E** *Comment Status* **A** *ERL tukey (bucket1)*

New ERL parameters

SuggestedRemedy

Add rows for Tfx and Tukey window flag in Table 93A-4, ERL parameters

Response *Response Status* **C**

ACCEPT.

Cl **93A** *SC* **93A.5.1** *P* **202** *L* **39** # 237

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **A** *ERL tukey (bucket5)*

Unexplained notation of up and down: v ^

SuggestedRemedy

Remove it. Just say "and" "or" or whatever you mean. Or, don't cram with-Tukey and without-Tukey into one equation; you can easily say if Tw is zero, Htw is 1, and if it's one, the equation (somewhat simpler) applies.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using response to comment #34.

Cl **93A** *SC* **93A.5.1** *P* **202** *L* **41** # 238

Dawe, Piers Nvidia

Comment Type **T** *Comment Status* **A** *ERL tukey (bucket4)*

This way of writing the middle row of the equation is unnecessarily complicated.

SuggestedRemedy

Simplify it, remembering that cos(x)=cos(-x)=-cos(x+-pi). Notice that f < fb in this case and fper is +ve, with fb before fr in the formula.
Something like 0.5(1-cos(2pi(fb-f)/fper))

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Update the equation with the form proposed in the suggested remedy.

Cl **93A** *SC* **93A.5.1** *P* **202** *L* **41** # 34

Healey, Adam Broadcom Inc.

Comment Type **E** *Comment Status* **A** *ERL tukey (bucket4)*

The notation used in Equation (93A-58a) is unecessarily obscure. I assume it is intended to set H_tw(f) to 1 when tw = 0 and to the Tukey window function when tw = 1.

SuggestedRemedy

Remove the "tw" qualification from the terms in Equation (93A-58a). Add a sentence that states that H_tw(f) is defined by Equation (93-58a) when tw is 1 and H_tw(f) is 1 when tw is 0 or is not defined. Remove the definition of "tw" from the variable list (page 203, line 12).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement suggested remedy with editorial license.

Cl **93A** *SC* **93A.5.1** *P* **202** *L* **45** # 76

Brown, Matt Huawei

Comment Type **T** *Comment Status* **A** *ERL tukey (bucket1)*

The variable f_r used in equation 93A-58b is not included in the associated variable list.

SuggestedRemedy

Add fr and its definition to the variable list below Equation 93A-58b.

Response *Response Status* **C**

ACCEPT.

Cl **120F** *SC* **120.F.3.1** *P* **208** *L* **1** # 140

Ghiasi, Ali Ghiasi Quantum/Inphi

Comment Type **T** *Comment Status* **R** *TP0v (bucket4)*

Until it is proven TP0v with real measurement the electrical characteristics should be at TP0a, there is no need create all this confusion and complexity by introducing TP0v when the solution is trivial just increase the DUT board loss to 2.4 dB as we have done for MCB and HCB!

SuggestedRemedy

Change TP0v to TP0a

Response *Response Status* **C**

REJECT.

Resolve using the response to comment #135.

[Editor's note: CC: 120F, 163]

Cl **120F** *SC* **120.F.3.1** *P* **208** *L* **13** # 141

Ghiasi, Ali — Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **R** *TX CM AC noise*

30 mV AC common mode results in 1+ dB of COM penalty, there is no technical bases for using such large amount of AC common mode

SuggestedRemedy

Reduce TX AC common mode from 30 mV to 15 mV RMS

Response *Response Status* **C**

REJECT.

The following presentation was reviewed by the task force:
https://www.ieee802.org/3/ck/public/20_10/ran_3ck_04_1020.pdf

There is insufficient evidence to make the proposed changes. Further analysis is encouraged. There was no consensus to make the proposed changes at this time.

[Editor's note: CC: 162, 163, 120F]

Cl **120F** *SC* **120F.3.1** *P* **207** *L* **14** # 203

Wu, Mau-Lin — MediaTek

Comment Type **T** *Comment Status* **A** *ERL value (bucket5)*

dERL is still TBD

SuggestedRemedy

Suggest to set as some negative values. I had shared some information in wu_3ck_adhoc_01_092320.pdf. I plan to prepare one contribution, wu_3ck_02_1120.pdf, for this comment.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

The referenced ad hoc presentations is here:
https://www.ieee802.org/3/ck/public/adhoc/sept23_20/wu_3ck_adhoc_01a_092320.pdf

Resolve using the value the response to comment #61.

Cl **120F** *SC* **120F.3.1** *P* **208** *L* **14** # 54

Ran, Adee — Intel

Comment Type **E** *Comment Status* **A** *ERL reference (bucket1)*

Reference to dERL in the table should be the subclause that specifies parameters and points to the annex.

SuggestedRemedy

Change reference for dERL in table 120F-1 from 163A.3.2.2 to 120F.3.1.1.

Response *Response Status* **C**

ACCEPT.

Cl **120F** *SC* **120F.3.1** *P* **208** *L* **14** # 82

Brown, Matt — Huawei

Comment Type **T** *Comment Status* **A** *ERL value (bucket5)*

A value for dERL is required. If an appropriate reference transmitter is defined, then a value of 0 should be correct.

SuggestedRemedy

Replace TBD with 0.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

The referenced ad hoc presentations is here:
https://www.ieee802.org/3/ck/public/adhoc/sept23_20/wu_3ck_adhoc_01a_092320.pdf

Resolve using the value the response to comment #61.

Cl **120F** *SC* **120F.3.1** *P* **208** *L* **18** # 83

Brown, Matt — Huawei

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

A value for dv_f is required. If an appropriate reference transmitter is defined, then a value of 0 should be correct.

SuggestedRemedy

Replace TBD with 0.

Response *Response Status* **C**

ACCEPT.

[Editor's note: Addresses incomplete specification.]

Cl **120F** *SC* **120F.3.1** *P* **208** *L* **20** # 13

Mellitz, Richard — Samtec

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

We need to specify V_peak/V_f not V_peak I.e. pulse peak loss

SuggestedRemedy

Change
Difference between measured and reference linear fit pulse peak
To
Difference between measured and reference linear fit pulse peak loss (min) d(V_peak/V_f)

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

It is assumed that the comment is requesting that the specification be for the ratio of V_peak/V_f, rather than just V_peak.
If that is the case, implement the following with editorial license…
To make the parameter easier to read and use, define the ratio R_peak equal to V_peak/V_f.
Define the difference between the reference and measured ratio as dR_peak.
For task force review.
[Editor's note: CC: 163, 120F]

Cl **120F** *SC* **120F.3.1** *P* **208** *L* **21** # 84

Brown, Matt — Huawei

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

A value for dv_peak is required. If an appropriate reference transmitter is defined, then a value of 0 should be correct.

SuggestedRemedy

Replace TBD with 0.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

The response to comment #13 replaces the specification of dv_peak to dR_peak.

Change the name of dv_peak to dR_peak and use the value 0 with no units.

Cl **120F** *SC* **120F.3.1** *P* **208** *L* **39** # 188

Calvin, John — Keysight Technologies

Comment Type **T** *Comment Status* **A** *EO jitter (bucket5)*

The spec limit for Even-Odd jitter is only 358 femtoseconds, which is too low to be accurately measured with current state of the art test equipment.

SuggestedRemedy

Increase the spec limit from 0.019 UI to 0.025 UI

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #190.

[Editor's note: CC: 120F, 120G, 162, 163]

Cl **120F** *SC* **120F.3.1.1** *P* **209** *L* **18** # 78

Brown, Matt — Huawei

Comment Type **E** *Comment Status* **A** *parameter name*

The parameter name "Difference between measured and reference steady-state voltage" is a real mouthful. A more concise name would beneficial.

SuggestedRemedy

Change "Difference between measured and reference steady-state voltage" to "difference steady-state voltage". Apply throughout 163, 120F, and 163A.

Response *Response Status* **C**

ACCEPT.

[Editor's note: CC: 120F, 163, 163A]

Cl **120F** *SC* **120F.3.1.1** *P* **209** *L* **21** # 79

Brown, Matt — Huawei

Comment Type **E** *Comment Status* **A** *parameter name*

The parameter name "Difference between measured and reference linear fit pulse peak" is a real mouthful. A more concise name would beneficial.

SuggestedRemedy

Change "Difference between measured and reference linear fit pulse peak" to "linear fit pulse
peak". Apply throughout 163, 120F, and 163A.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The response to comment #13 proposes to replaces v_peak with R_peak.

Change "Difference between measured and reference linear fit pulse peak" to "difference peak ratio".

[Editor's note: CC: 120F, 163, 163A]

Cl **120F** *SC* **120F.3.1.1** *P* **209** *L* **4** # 56

Ran, Adee — Intel

Comment Type **E** *Comment Status* **A** *(bucket1)*

Subclause heading "Transmitter effective return loss" should be consistent with "Transmitter ERL" in 163.9.2.3.

SuggestedRemedy

Change heading to "Transmitter ERL".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The use of "effective return loss" vs "ERL" is inconsistent throughout 120F, 120G, and 163. In 120F, 120G, and 163, use "effective return loss (ERL)" for the first use then use "ERL" thereafter as appropriate.
[Editor's note: CC: 120F, 120G, 163]

Cl **120F** *SC* **120F.3.1.1** *P* **209** *L* **6** # 33

Healey, Adam — Broadcom Inc.

Comment Type **E** *Comment Status* **A** *(bucket1)*

The parameter is defined to be "dERL" and not "[DELTA]ERL".

SuggestedRemedy

Update the name to be consistent.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #80.

Cl **120F** *SC* **120F.3.1.1** *P* **209** *L* **6** # 55

Ran, Adee — Intel

Comment Type **E** *Comment Status* **A** *(bucket1)*

Delta sign appears here (ΔERL) but the difference term is called dERL.

Also on line 26.

SuggestedRemedy

Change Delta to d in both cases.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #80.

Cl **120F** *SC* **120F.3.1.1** *P* **209** *L* **6** # 195

Wu, Mau-Lin — MediaTek

Comment Type **E** *Comment Status* **A** *(bucket1)*

The symbol "dERL (min)" here doesn't consist with "dERL (min)" in Table 120F-1.

SuggestedRemedy

Align with "dERL (min)" in Table 120F-1.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #80.

Cl **120F** *SC* **120F.3.1.1** *P* **209** *L* **6** # 80

Brown, Matt Huawei

Comment Type **E** *Comment Status* **A** *(bucket1)*

delta_ERL should be dERL.

SuggestedRemedy

Replace all instances of delta_ERL with dERL.

Response *Response Status* **C**

ACCEPT.

Cl **120F** *SC* **120F.3.1.1** *P* **209** *L* **14** # 77

Brown, Matt Huawei

Comment Type **E** *Comment Status* **A** *parameter name*

The parameter name "Difference between measured and reference effective return loss" is a real mouthful. A more concise name would beneificial.

SuggestedRemedy

Change "Difference between measured and reference effective return loss" to "difference effective return loss". Apply throughout 163, 120F, and 163A.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Note that the proposed response to comment #56 proposes to use "ERL" rather than "effective return loss".

Implement the suggested remedy considering the closed response to comment #56 with editorial license.

[Editor's note: CC: 120F, 163, 163A]

Cl **120F** *SC* **120F.3.1.1** *P* **209** *L* **26** # 169

Dudek, Mike Marvell.

Comment Type **E** *Comment Status* **A** *(bucket1)*

using the symbol for delta is a pain for normal typing and general report writing etc. d is used in table 120F-1 but the delta symbol is ued in other places.

SuggestedRemedy

Replace the symbol delta with d throughout Ammex 120F. Additional places I noticed were

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #80.

Cl **120F** *SC* **120F.3.1.1** *P* **209** *L* **26** # 196

Wu, Mau-Lin MediaTek

Comment Type **E** *Comment Status* **A** *(bucket1)*

The symbol "dERL (min)" here doesn't consist with "dERL (min)" in Table 120F-1.

SuggestedRemedy

Align with "dERL (min)" in Table 120F-1.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #80.

Cl **120F** *SC* **120F.3.1.1** *P* **209** *L* **26** # 171

Dudek, Mike Marvell.

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

using the symbol for delta is a pain for normal typing and general report writing etc. d is used in table 120F-1 but the delta symbol is ued in other places.

SuggestedRemedy

Replace the symbol delta with d throughout Ammex 120F. Additional places I noticed were

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **120F** *SC* **120F.3.1.3** *P* **210** *L* **43** # 190

Calvin, John — Keysight Technologies

Comment Type **T** *Comment Status* **A** *EO jitter*

Based on Sleigh/Calvin/LeCheminant presentation https://grouper.ieee.org/groups/802/3/ck/public/adhoc/sept16_20/calvin_3ck_adhoc_01_091620.pdf it has been shown that the EOJ measurement is susceptible to a systematic error based on the test pattern length and baud rate. This is easily resolved by allowing the CDR loop BW to be reduced below 4 MHz

SuggestedRemedy

Update the text of page 210 line 43 to read Even-odd jitter is calculated using the measurement method specified in 120D.3.1.8.2. with the exception that EOJ may be measured with a clock recovery unit (CRU) with a corner frequency of <= 4 MHz and a slope of 20 dB/decade

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The following presentations were reviewed by the task force:
https://www.ieee802.org/3/ck/public/20_10/calvin_3ck_01_1020.pdf
https://www.ieee802.org/3/ck/public/20_10/ran_3ck_01_1020.pdf
https://www.ieee802.org/3/ck/public/20_10/ran_3ck_02a_1020.pdf

Implement the proposal on slides 3 to 5 in ran_3ck_02a_1020 with editorial license.

[Editor's note: CC: 120F, 120G, 162, 163]

Straw poll #11 (decision)
I support resolving comments 48, 186, 189, 52, 187, 188, 127, 190 with the proposed changes in slides 3-5 of ran_3ck_02a_1020.
1: Yes -- 31
2: No -- 7

Cl **120F** *SC* **120F.3.1.3** *P* **210** *L* **43** # 127

Hidaka, Yasuo — Credo Semiconductor

Comment Type **T** *Comment Status* **A** *EO jitter (bucket5)*

As Rob presented and we discussed at ad hoc on 9/16/2020, EOJ methodology defined in 120D.3.1.8.2 does not correctly measure EOJ due to length of PRBS13Q and 4MHz bandwidth of clock recovery.

To prevent CDR from tacking two cycles of test pattern, the best solution may be to use a test pattern shorter than PRBS13Q.

SuggestedRemedy

Define PRBS9Q test pattern in clause 120.5.11.2, similar to PRBS13Q in 120.5.11.2.1, but using PRBS9 defined in Table 68-6.

Choose 12 edges in PRBS9Q test pattern, and add a table similar to Table 120D-4.

Add a sub clause how to measure EOJ using PRBS9Q, similar to 120D.3.1.8.2.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #190.

[Editor's note: CC: 120F, 120G, 162, 163]

Cl **120F** *SC* **120F.3.2** *P* **211** *L* **32** # 14

Mellitz, Richard — Samtec

Comment Type **TR** *Comment Status* **A** *TP5v (bucket2)*

TP5a is moot and replaced by TP5v

SuggestedRemedy

point to Rx table in 163 line done in table 120F-1

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #40.

Cl **120F** *SC* **120F.3.2.1** *P* **211** *L* **40** # 85

Brown, Matt Huawei

Comment Type **T** *Comment Status* **A** *ERL value (bucket6)*

The receiver ERL should be defined and measured in the same way as for the transmitter.

SuggestedRemedy

Assuming that the receiver test fixture is aligned with the transmitter test fixture, specify the receiver ERL using the same specification as the transmitter ERL using dERL in 120F.3.1.1. In Table 120F-3, replace the the parameter name and set the specification to 0 dB.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #67.

[Editor's note: CC: 120F, 163]

Cl **120F** *SC* **120F.3.2.3** *P* **212** *L* **42** # 170

Dudek, Mike Marvell.

Comment Type **T** *Comment Status* **A** *(bucket1)*

There isn't a return loss spec in 163.9.2.1

SuggestedRemedy

Change "return loss" to "effective return loss"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change "return loss" to "ERL".

Cl **120F** *SC* **120F.3.2.3** *P* **212** *L* **42** # 172

Dudek, Mike Marvell.

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

There isn't a return loss spec in 163.9.2.1

SuggestedRemedy

Change "return loss" to "effective return loss"

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **120F** *SC* **120F.3.2.3** *P* **213** *L* **1** # 86

Brown, Matt Huawei

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

For the SNDR measurement in item e) of receiver interference tolerance test considerations the value for N_p is not set.

SuggestedRemedy

Replace TBD with an appropriate value.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Resolve using the response to comment #280.

Cl **120F** *SC* **120F.3.2.3** *P* **213** *L* **1** # 280

Li, Mike Intel

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

Np TBD

SuggestedRemedy

Np = 11, see li_3ck_01_0920

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

The following presentation was reviewed by the task force:
https://www.ieee802.org/3/ck/public/20_10/li_3ck_01_1020.pdf

Implement the suggested remedy.

Cl **120F** *SC* **120F.3.2.3** *P* **213** *L* **16** # 281

Ran, Adee Intel

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

"Bessel-Thomson low pass response with 53 GHz 3 dB bandwidth" - we have 40 GHz all other places.

This is for calibrating the pattern geenrator in the receiver test setup. Is no reason for higher bandwidth in this specific subclause. All pracedent cases use the same bandwidth as for the transmitter's test (e.g. 33 GHz in 120D.3.2.1).

SuggestedRemedy

Change "53" to "40".

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **120F** *SC* **120F.3.2.3** *P* **213** *L* **18** # 142

Ghiasi, Ali Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **R** *RX CM AC noise*

Inteference tolerance must include AC common mode

SuggestedRemedy

Add step k to the list: Adjust stressor P/N skew if necessary to achive 17.5 mV AC RMS.

Response *Response Status* **C**

REJECT.

The comment is proposing to add a new specification for the receiver: receiver CM AC noise tolerance.

The proposed solution is not sufficiently complete to implement. Also, more analysis is required to determine appropriate stress signal characteristics and whether this is necessary.

Cl **120F** *SC* **120F.3.2.3** *P* **213** *L* **31** # 2

Mellitz, Richard Samtec

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

DFE4_RSS > 0.05 may be difficult to achieve with test equipment. The published C2C have a DFE4_RSS range between 0.03 V and 0.065 with a mean of 0.047 .

SuggestedRemedy

Since these represent design expectation set DFE4_RSS to 0.03 which would be achievable in test setups.

Response *Response Status* **C**

REJECT.

There is no consensus to make the proposed change.

Cl **120F** *SC* **120F.3.2.4** *P* **214** *L* **16** # 201

Wu, Mau-Lin MediaTek

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

It mentions that "The receiver under test shall meet the FEC symbol error ratio requirement for each case in Table 162-15". However, the FEC symbol error ratio requirement is 1e-3 in Table 162-15, which is for KR & CR. For C2C application, the FEC symbol error ratio requirement shall be 1e-4.

SuggestedRemedy

Change the sentence to "The receiver under test shall meet 1e-4 FEC symbol error ratio requirement for each case in Table 162-15."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The comment points out a valid issue. However, it would be better to coordinate the specification method of symbol error ratio for the 3 interfaces.
The text in 162 points to Table 162-14 for the FEC symbol error ratio so having it in the jitter tolerance table is not necessary or helpful.
Remove FEC symbol error ratio row in Table 162-15.
In 163.9.3.4, change the sentence on page 183, line 50 to:
"The receiver under test shall meet the FEC symbol error ratio in Table 163-10, for each case in Table 162–15."
In 120F.3.2.4, change the sentence on page 214, line 16 to:
"The receiver under test shall meet the FEC symbol error ratio in Table 120F-5 for each case in Table 162–15."
In several locations fix capitalization and change "FEC Symbol error ratio" to "FEC symbol error ratio".
[Editor's note: CC: 162, 163, 120F]

Cl **120F** *SC* **120F.4.3** *P* **217** *L* **44** # 87

Brown, Matt — Huawei

Comment Type **T** *Comment Status* **R** *ERL value (bucket5)*

The ERL value is specified as TBD.

SuggestedRemedy

Replace TBD with an appropriate value.

Response *Response Status* **C**

REJECT.

[Editor's note: Addresses incomplete specification.]

The response to closed comment #114 indicates that there was no consensus to make the changes proposed in this comment.

Cl **120G** *SC* **120G.2** *P* **225** *L* **29** # 239

Dawe, Piers — Nvidia

Comment Type **T** *Comment Status* **R** *terminology*

Terminology should align better with that agreed after debate in P802.3ba or bs, and with the text.

SuggestedRemedy

In Figure 120G-4, Module compliance points, change "Receiver" to "Electrical input", and change "Transmitter" to "Electrical output".

Response *Response Status* **C**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **120G** *SC* **120G.3.1** *P* **224** *L* **9** # 148

Ghiasi, Ali — Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **R** *CM DC voltage*

KR/CR chips are defiend with common mode of 0.2 V to 1.0 V, there is no reason to define the same host to have such large output common mode voltage. If the CDR in the module is BiCMOS and uses 3.3 V then one will use the right voltage rating but if the CDR in the module is CMOS then one doesn't need to use 3.3V+ DC blocks.

SuggestedRemedy

Reduce common mode min to 0.2 V and common mode max to 1.0 V

Response *Response Status* **C**

REJECT.

In 802.3ck…
CR TX DC CM voltage (max) = 1.9 V
KR TX DC CM voltage (max/min) = 1.0/0.2 V
C2C TX DC CM voltage (max/min) = 1.9/0 V
C2M host in/out CM voltage (max/min) = 2.8/-0.3 V
C2M module in/out CM voltage (max/min) = 2.85/-0.35 V
There is not good alignment of CM voltage amongst each of the interfaces listed above. It would make more sense align the module interfaces with the CR specifications.
Alternately, align all of the interfaces.

There is no consensus to make the proposed changes.

[Editor's note: CC: 120F, 120G, 162]

Cl **120G** *SC* **120G.3.1** *P* **226** *L* **17** # 240

Dawe, Piers — Nvidia

Comment Type **TR** *Comment Status* **A** *ew/esmw (bucket5)*

We need an ESMW limit because in C2M, the effects of driver jitter and part-channel are limited in combination not separately. Eye width measurement works with or without a DFE in the reference receiver; examples in louchet_3ck_adhoc_01a_092320.pdf .
If the VEC values in this draft and Annex 120E, and the ESMW in Annex 120E is right, ESMW should be between 0.22 and 0.3 UI.

SuggestedRemedy

Write down a range of candidate limits in the next draft, or a single limit if we have enough information to choose one.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Resolve this comment using the response to comment #41.

Cl **120G** SC **120G.3.1** P **226** L **17** # 209

Ran, Adee Intel

Comment Type **T** *Comment Status* **A** *ew/esmw (bucket5)*

The reference for ESMW is subclause 120G.3.1.6 which does not address ESMW at all.

Note: In another comment, ESMW is proposed to be removed.

SuggestedRemedy

If ESMW is not removed, change the reference from 120G.3.1.6 to 120G.5.2 in Table 120G–1 and in Table 120G–3.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Resolve using the response to comment #41.

Cl **120G** SC **120G.3.1** P **226** L **17** # 208

Ran, Adee Intel

Comment Type **T** *Comment Status* **A** *ew/esmw (bucket5)*

ESMW is TBD.

The importance of ESMW is not clear and there has been no proposal for a value for this parameter.

It is suggested to remove EMSW, at least until evidence of the need for it (in addition to the existing EH and VEC limits) and a robust
measurement method are presented, and a value for limit is proposed.

SuggestedRemedy

Remove the EMSW row from this table (120G-1), and also from Table 120G–3 (twice), Table 120G–6, and Table 120G-9.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Resolve using the response to comment #41.

Cl **120G** SC **120G.3.1** P **226** L **17** # 88

Brown, Matt Huawei

Comment Type **T** *Comment Status* **A** *ew/esmw (bucket5)*

Host output eye symmetry mask width (ESMW) value is TBD. Discussion during D1.2 comment resolution revealed that an eye width measurement using the currently defined reference receiver and related methodology as defined is not meaningful.

SuggestedRemedy

Either fix the methodology and provide a value or replace with an appropriate alternative specification.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Resolve this comment using the response to comment #41.

Cl **120G** SC **120G.3.1** P **226** L **17** # 89

Brown, Matt Huawei

Comment Type **T** *Comment Status* **A** *ew/esmw (bucket5)*

In Table 120G-1, the reference for host output eye symmetry mask width (ESMW) value points to 120G.3.1.6. However, 120G.3.1.6 does not specify how to measure ESMW or what to do with it.

SuggestedRemedy

In 120G.3.1.6, add methodology for ESMW and explain the relevance.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Resolve this comment using the response to comment #41.

Cl **120G** *SC* **120G.3.1** *P* **226** *L* **17** # 41

Healey, Adam — Broadcom Inc.

Comment Type **T** *Comment Status* **A** *ew/esmw*

ESMW (eye symmetry mask width) is "TBD". Similarly, eye width specifications for stressed input parameters are also "TBD". These parameters will be difficult to define for a reference receiver that includes decision feedback equalization unless the behavior of the feedback signal in the vicinity of the threshold crossings is clearly defined. However, there are other, simpler means to enforce that the reference receiver output has a useable eye width. The most straight-forward implementation for this draft is to expand on a feature of the eye height and vertical eye closure measurement procedure referred to in 120G.5.2 item h). This items points to 120E.4.2 and 120E.4.3 for the method to measure eye height, vertical eye closure, and other parameters. Step 4) in 120E.4.3 states that the distribution of the signal voltage (from which eye height and vertical eye closure are derived) is to be measured over a window "within 0.025 UI of time TCmid". This essentially averages the distribution over the time window or, thought of a different way, is similar to having a uniform jitter distribution around TCmid. Use of such a window reduces the measured eye height and vertical eye closure for signals with narrower eye widths. The width of the window can be increased to provide higher degrees of protection.

SuggestedRemedy

Remove references to ESMW and eye height from Annex 120G. Change 120G.5.2 item h) to the following: "From the eye diagram, compute eye height and vertical eye closure using the methodologies defined in 120E.4.2 and 120E.4.3 with the following exceptions. The value of TCmid is set to the sampling phase t_s determined in step d) (skipping steps 1) through 3) from 120E.4.2). The CDFs of the signal voltages computed in 120E.4.2 steps 4) through 6) are the average values over the time interval t_s-0.05 UI to t_s+0.05 UI. The feedback coefficients b(n) determined in step d) are constant over the averaging time interval."

Note that eye height and vertical eye closure limits may need to be adjusted to account for the reductions to these values via the averaging window.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

It is assumed that in the suggested remedy, the intent was to refer to eye width rather than eye height.
The EW and ESMW specifications are incomplete both in values and in method as the draft is currently written.
Implement suggested remedy with editorial license, except remove "eye width" rather than "eye height".
Add an editorial note that all EH and VEC values currently specified may need to be adjusted to account for this new methodology.
For task force discussion.

[Editor's note (to be removed prior to closing this comment): The following is an alternate response based on consensus presentation healey_02.]

The following related presentations were reviewed by the task force:
https://www.ieee802.org/3/ck/public/20_10/healey_3ck_01a_1020.pdf
https://www.ieee802.org/3/ck/public/20_10/dawe_3ck_01a_1020.pdf
https://www.ieee802.org/3/ck/public/20_10/healey_3ck_02_1020.pdf

Based on the results of straw poll #12 there is strong consensus for Alt #2 with TBD = 50 mUI.

Implement with editorial license the proposal for Alt 2 in healey_02 with TBD = 50 mUI.

Straw Poll #9:
I support the EW/ESMW direction of (Chicago rules):
A: Keep ESMW and eye width
B: Replace EH, ESMW, and eye width with an eye mask as proposed in dawe_3ck_01_1020
C: Remove ESMW and eye width and redefine EH and VEC as proposed in healey_3ck_01a_1020
D: Remove ESMW and eye width and leave EH and VEC as is
Results: A: 9, B: 10, C: 24, D: 6

Straw poll #12
[Chicago rules]
I would support replacing ESMW and EW with the following option from healey_3ck_02_1020:
A. “Alt. 2” with TBD = 50 mUI
B. “Alt. 1” with TBD1 = 25 mUI and TBD2 = 25 mUI
C. “Alt. 1” with TBD1 = 50 mUI and TBD2 = 20 mUI
D. “Alt. 2” with TBD = 70 mUI

A: 18 B: 8 C: 4 D: 9

Cl **120G** *SC* **120G.3.1** *P* **226** *L* **23** # 90

Brown, Matt — Huawei

Comment Type **T** *Comment Status* **A** *ERL value (bucket5)*

The host output ERL value is TBD.

SuggestedRemedy

Replace TBD with an appropriate value.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Resolve using the response to comment #114.

Cl **120G** *SC* **120G.3.1** *P* **226** *L* **26** # 91

Brown, Matt — Huawei

Comment Type **T** *Comment Status* **A** *transition time*

The host output minimum transition time value is TBD. Since the transition time is measured after considerable loss and parasitics between the host device and the measurement point it seems unecessary to specify this parameter.
Alternately, use the transition time used in the the various COM simulations (7.5 ps).

SuggestedRemedy

Delete the host output transition time.
Alternately replace TBD with 7.5 ps.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Replace TBD with 7.5 ps.

Cl **120G** *SC* **120G.3.1.1** *P* **226** *L* **41** # 241

Dawe, Piers — Nvidia

Comment Type **E** *Comment Status* **A** *(bucket1)*

Font size of 53.125

SuggestedRemedy

Fix

Response *Response Status* **C**

ACCEPT.

Cl **120G** *SC* **120G.3.1.1** *P* **226** *L* **41** # 242

Dawe, Piers — Nvidia

Comment Type **T** *Comment Status* **A** *wording (bucket6)*

per lane

SuggestedRemedy

for each lane

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

In 120F and 120G, change instances of "per lane" to "for each lane", where appropriate.

Cl **120G** *SC* **120G.3.1.3** *P* **227** *L* **46** # 143

Ghiasi, Ali — Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **R** *ERL parameter (bucket5)*

Rx of 0.618 implies permitted reflection of -4.2 dB which can be problematic for C2M receiver with just 4T DFE, at 50G we have Rx of 0.19. Extensive analysis was performed by Mr. Mellitz but C2M measurement points are at TP1a and TP4 not an end-end link using COM
https://www.ieee802.org/3/ck/public/adhoc/jun10_20/mellitz_3ck_adhoc_01a_061020.pdf

SuggestedRemedy

Recommend changing back to the original Rx=0.19 which equates to -14.4 dB unless it can be proven that -4.2 dB would work on a link where compliance is not at the slicer.

Response *Response Status* **C**

REJECT.

The response to closed comment #114 indicates that there was no consensus to make the changes proposed in this comment.

Cl **120G** *SC* **120G.3.1.6** *P* **228** *L* **24** # 92

Brown, Matt — Huawei

Comment Type **T** *Comment Status* **R** *eye opening crosstalk*

The parameter values for the host output eye opening crosstalk source are TBD as follows: "The crosstalk generator is calibrated at TP4 (without the use of a reference receiver) with target differential peak-to-peak amplitude of TBD mV and slew time of TBD ps between –TBD V and +TBD V." Use the maximum peak to peak value from Table 120G-1, range of 20% to 80%, and minimum transition time from Table 120G-1 (value proposed in another comment).

SuggestedRemedy

Replace with the following:
The crosstalk generator is calibrated at TP4 (without the use of a reference receiver) with target differential peak-to-peak amplitude of 870 mV and slew time of 7.5 ps between –261 V and +261 V.

Response *Response Status* **C**

REJECT.

[Editor's note: Addresses incomplete specification.]

There is no consensus to make any changes at this time.

Cl **120G** *SC* **120G.3.2** *P* **229** *L* **32** # 97

Brown, Matt Huawei

Comment Type **T** *Comment Status* **A** *transition time*

The module output minimum transition time value is TBD. Since the transition time is measured after considerable loss and parasitics between the host device and the measurement point it seems unecessary to specify this parameter.
Alternately, use the transition time used in the the various COM simulations (7.5 ps).

SuggestedRemedy

Delete the host output transition time.
Alternately replace TBD with 7.5 ps.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Replace TBD with 7.5 ps.

Cl **120G** *SC* **120G.3.2** *P* **229** *L* **17** # 94

Brown, Matt Huawei

Comment Type **T** *Comment Status* **A** *ew/esmw (bucket5)*

In Table 120G-3, the reference for module output near-end and far-end eye symmetry mask width (ESMW) points to 120G.3.1.6. However, 120G.3.1.6 does not specify how to measure ESMW or what to do with it.

SuggestedRemedy

In 120G.3.1.6, add methodology for ESMW and explain the relevance.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Resolve this comment using the response to comment #41.

Cl **120G** *SC* **120G.3.2** *P* **229** *L* **17** # 93

Brown, Matt Huawei

Comment Type **T** *Comment Status* **A** *ew/esmw (bucket5)*

Module output near-end and far-end eye symmetry mask width (ESMW) values are TBD. Discussion during D1.2 comment resolution revealed that an eye width measurement using the currently defined reference receiver and related methodology as defined is not meaningful.

SuggestedRemedy

Either fix the methodology and provide a value or replace with an appropriate alternative specification.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Resolve this comment using the response to comment #41.

Cl **120G** *SC* **120G.3.2** *P* **229** *L* **17** # 243

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **A** *ew/esmw (bucket5)*

We need ESMW limits because in C2M, the effects of driver jitter and part-channel are limited in combination not separately. Eye width measurement works with or without a DFE in the reference receiver; examples in louchet_3ck_adhoc_01a_092320.pdf .
Annex 120E has NE ESMW 0.265 UI. Here we expect worse reflections but a more capable equaliser. If we stay with the two-settings method, ESMW should be somewhere in the range 0.2 to 0.265 UI

SuggestedRemedy

Write down a range of candidate limits in the next draft, or a single limit if we have enough information to choose one.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Resolve this comment using the response to comment #41.

Cl **120G** *SC* **120G.3.2** *P* **229** *L* **19** # 244

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **R** *TP4 NE EH*

For a reasonably clean module (or test equipment in a host stressed eye test), the driver swing has to be aggressively reduced to deliver only 24 mV. If the module is set to the "near" setting, and the host receiver isn't that near, the eye it is offered is smaller than 24 mV because of loss, and out of tune as well. 120E has 70 mV.

SuggestedRemedy

Change the NEEH from 24 mV to 50 mV.

Response *Response Status* **C**

REJECT.

The comment does not provide evidence that 24 mV specification is not appropriate.

It only points out that for loss greater than the HCB the host device might see something lower.

Some support was expressed during comment resolution however there is not consensus to implement the proposed change. Further justification is required.

Cl **120G** *SC* **120G.3.2** *P* **229** *L* **22** # 245

Dawe, Piers Nvidia

Comment Type **T** *Comment Status* **A** *ew/esmw (bucket5)*

We need ESMW limits because in C2M, the effects of driver jitter and part-channel are limited in combination not separately. Eye width measurement works with or without a DFE in the reference receiver; examples in louchet_3ck_adhoc_01a_092320.pdf .
Annex 120E has FE ESMW 0.2 UI, no explicit VEC limit, and EH 30 mV. Here we expect worse reflections but a more capable equaliser. If we stay with the two-settings method, ESMW should be somewhere in the range 0.16 to 0.2 UI. But 0.16 seems too small.

SuggestedRemedy

Write down a range of candidate limits in the next draft, or a single limit if we have enough information to choose one.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Resolve this comment using the response to comment #41.

Cl **120G** *SC* **120G.3.2** *P* **229** *L* **26** # 96

Brown, Matt Huawei

Comment Type **T** *Comment Status* **A** *precursor ISI ratio (bucket4)*

Module output far-end pre-cursor ISI ratio value is TBD. The related measurement methodology was rewritten in D1.3.

SuggestedRemedy

Replace TBD with an appropriate value.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Resolve using the response to comment #150.

Cl **120G** *SC* **120G.3.2** *P* **229** *L* **26** # 246

Dawe, Piers Nvidia

Comment Type **T** *Comment Status* **A** *precursor ISI ratio (bucket4)*

We don't know what to do with far-end pre-cursor ISI ratio. It was copied in from a spec with a very different reference receiver. In this scenario, we don't know what it's for, what a limit should be, or why.
I believe that the ordinary EH, EW and VEC specs with this reference receiver will defend receivers from the same threats that far-end pre-cursor ISI ratio in 120E was intended to guard against, except possibly for some drivers with exemplary noise, jitter and distortion but not so well tuned which can be received anyway.

SuggestedRemedy

We could leave this TBD hanging around in case someone finds a use for it, or clean it up for now while no-one has. We can bring it back later if justified.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Resolve using the response to comment #150.

Cl **120G** *SC* **120G.3.2** *P* **229** *L* **29** # 95

Brown, Matt — Huawei

Comment Type **T** *Comment Status* **R** *ERL value (bucket5)*

The module output ERL value is TBD.

SuggestedRemedy

Replace TBD with an appropriate value.

Response *Response Status* **C**

REJECT.

[Editor's note: Addresses incomplete specification.]

The response to closed comment #114 indicates that there was no consensus to make the changes proposed in this comment.

Cl **120G** *SC* **120G.3.2** *P* **229** *L* **34** # 147

Ghiasi, Ali — Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **D** *CM DC voltage*

KR/CR chips are defiend with common mode of 0.2 V to 1.0 V, there is no reason to define the same host with such high common mode.
If the CDR in the module is BiCMOS and uses 3.3 V then one will use the right voltage rating but if the CDR in the module is CMOS then one doesn't need to use 3.3V+ DC blocks.

SuggestedRemedy

Reduce common mode min to 0.2 V and common mode max to 1.0 V

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **120G** *SC* **120G.3.2.1** *P* **229** *L* **46** # 247

Dawe, Piers — Nvidia

Comment Type **TR** *Comment Status* **R** *TP4 settings*

As already discussed, the 2-settings method with only two compliance losses doesn't work. If the module is set to the short setting, and the host receiver isn't that near, the eye it is offered is smaller than 24 mV because of loss, and out of tune as well. If the module is set to the long setting and the host isn't that long, the eye is also out of tune. There's no guarantee that either setting is usable.

SuggestedRemedy

We need four compliance losses forming two overlapping ranges, or go back to the one-setting method which is much preferable for avoiding complexity, firmware and interop issues.

Response *Response Status* **C**

REJECT.

The comment does not provide sufficient evidence that further changes are required.

The first option proposed in the suggested remedy is not sufficiently complete to implement.

The second option would revert to a single-setting.

There is some support for the first option however a complete proposal is required.

Cl **120G** *SC* **120G.3.2.1** *P* **229** *L* **48** # 144

Ghiasi, Ali — Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **R** *TP4 settings*

It is stated that module has two setting one settting for short and one setting for long, not clear what short and long are nor clear if the link must work between short and long!

SuggestedRemedy

Define short channel as following: Any host channel with loss up to 11 dB.
Define long channel as following: Any host channel with loss >11 dB.

Response *Response Status* **C**

REJECT.

This interface specification is written with the assumption that the maximum host insertion loss is around 11.9 dB. So providing a setting for going beyond 11 dB is not helpful.

The intent of having two settings, generically labelled short and long, is to provide appropriate amplitude and emphasis based on the host capabilities.
The setting is potentially chosen by a combination of the host device and the channel characteristics, and not solely based on the host channel insertion loss.
Near-end and far-end tests are specified for the module and it must meet both specifications with the appropriate setting of tx_eq_state, see 120G.3.3.2.1.

However, the setting of module tx_eq_state is not clearly specified for the host input specifications. A proposal for how the module equalization is set for operation would be helpful.

There is no consensus to implement the proposal.

Cl **120G** *SC* **120G.3.2.1** *P* **229** *L* **51** # 182

Maki, Jeffery — Juniper Networks

Comment Type **T** *Comment Status* **A** *C2M modes*

For host management of module equalization, it would be aligned with modern management interface specifications (e.g., CMIS with use of SFF-8024 Table 4-5 Host Electrical Interface Codes) to designate a nomenclature for the configuration that the module advertises it supports and the host selects. Since there are only two states to choose between, short and long, this is a very practical approach.

SuggestedRemedy

Add immediately after first occurrence of tx_eq_state the text, "also designated as 100GAUI-1-S or 100GAUI-1-L for 100GAUI-1 C2M, 200GAUI-2-S or 200GAUI-2-L for 200GAUI-2 C2M and 400GAUI-4-S or 400GAUI-4-L for 400GAUI-4 C2M." For the second occurrence of tx_eq_state, insert immediately after "tx_eq_state is 0" the text "or 100GAUI-1-S is selected for 100GAUI-1 C2M, or 200GAUI-2-S is selected for 200GAUI-2 C2M or 400GAUI-4-S is selected for 400GAUI-4 C2M." For the third occurrence of tx_eq_state, insert immediately after "tx_eq_state is 1" the text "or 100GAUI-1-L is selected for 100GAUI-1 C2M, or 200GAUI-2-L is selected for 200GAUI-2 C2M or 400GAUI-4-L is selected for 400GAUI-4 C2M." For the fourth occurrence of tx_eq_state, insert immediately after "tx_eq_state" the text "or the use of 100GAUI-1-S or 100GAUI-1-L for 100GAUI-1 C2M, 200GAUI-2-S or 200GAUI-2-L for 200GAUI-2 C2M and 400GAUI-4-S or 400GAUI-4-L for 400GAUI-4 C2M." Note this is very similar to BiDi optics that designate a base PMD name and an extended name for the "down" and "up" PMD. See for example Cluase 58.1 for 100BASE-BX10, where it is written "100BASE-BX10-D PMD at one end and a 100BASE-BX10-U PMD at the other." Here we use the extened AUI name to indicate choice of equalization, short or long.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The following presentation was reviewed by the task force:
https://www.ieee802.org/3/ck/public/20_10/maki_3ck_01b_1020.pdf

Implement with editorial license the proposal in slide 9 of the referenced presentation.

Cl **120G** *SC* **120G.3.2.2** *P* **230** *L* **6** # 183

Maki, Jeffery — Juniper Networks

Comment Type **T** *Comment Status* **A** *C2M modes*

For host management of module equalization, it would be aligned with modern management interface specifications (e.g., CMIS with use of SFF-8024 Table 4-5 Host Electrical Interface Codes) to designate a nomenclature for the configuration that the module advertises it supports and the host selects. Since there are only two states to choose between, short and long, this is a very practical approach.

SuggestedRemedy

Insert immediately after "tx_eq_state set to 0" the text "or 100GAUI-1-S is selected for 100GAUI-1 C2M, or 200GAUI-2-S is selected for 200GAUI-2 C2M or 400GAUI-4-S is selected for 400GAUI-4 C2M." Insert immediately after "tx_eq_state set to 1" the text "or 100GAUI-1-L is selected for 100GAUI-1 C2M, or 200GAUI-2-L is selected for 200GAUI-2 C2M or 400GAUI-4-L is selected for 400GAUI-4 C2M."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #182.

Cl **120G** *SC* **120G.3.2.2** *P* **230** *L* **14** # 98

Brown, Matt — Huawei

Comment Type **T** *Comment Status* **R** *crosstalk*

The parameter values for the module output eye opening crosstalk source are TBD as follows:
"The crosstalk generator is calibrated at TP1a (without the use of a reference receiver) with target differential peak-to-peak amplitude of TBD mV and target transition time of TBD ps."
Use the maximum peak to peak value and minimum transition time value (proposed in another comment) from Table 120G-1.

SuggestedRemedy

Replace with the following:
"The crosstalk generator is calibrated at TP1a (without the use of a reference receiver) with target differential peak-to-peak amplitude of 900 mV and target transition time of 7.5 ps."

Response *Response Status* **C**

REJECT.

[Editor's note: Addresses incomplete specification.]

The proposed transition time is much smaller than would be expected. Further analysis and proposal is required.

There is no consensus make any changes at this time.

Cl **120G** *SC* **120G.3.2.2.1** *P* **230** *L* **47** # 248

Dawe, Piers — Nvidia

Comment Type **E** *Comment Status* **A** *(bucket1)*

~9.6dB

SuggestedRemedy

approximately 9.6 space dB

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace "~9.6dB" with "approximately 9.6 dB".

Cl **120G** *SC* **120G.3.2.2.1** *P* **230** *L* **49** # 249

Dawe, Piers — Nvidia

Comment Type **E** *Comment Status* **A** *(bucket1)*

with an exception to use zp = 244.7 mm, and C0 and C1 are both 0 nF

SuggestedRemedy

with the exceptions that zp is 244.7 mm, and C0 and C1 are both 0 nF

Response *Response Status* **C**

ACCEPT.

Cl **120G** *SC* **120G.3.2.3** *P* **231** *L* **16** # 145

Ghiasi, Ali — Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **R** *ERL parameter (bucket5)*

Rx of 0.618 implies permitted reflection of -4.2 dB which can be problematic for C2M receiver with just 4T DFE, at 50G we have Rx of 0.19. Extensive analysis was performed by Mr. Mellitz but C2M measurement points are at TP1a and TP4 not an end-end link using COM
https://www.ieee802.org/3/ck/public/adhoc/jun10_20/mellitz_3ck_adhoc_01a_061020.pdf

SuggestedRemedy

Recommend changing back to the original Rx=0.19 which equates to -14.4 dB unless it can be proven that -4.2 dB would work on a link where compliance is not at the slicer.

Response *Response Status* **C**

REJECT.

The response to closed comment #114 indicates that there was no consensus to make the changes proposed in this comment.

Cl **120G** *SC* **120G.3.3** *P* **231** *L* **43** # 99

Brown, Matt
Huawei

Comment Type **T** *Comment Status* **A** *ERL value (bucket5)*

The host input ERL value is TBD.

SuggestedRemedy

Replace TBD with an appropriate value.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Resolve using the response to comment #114.

Cl **120G** *SC* **120G.3.3** *P* **231** *L* **47** # 146

Ghiasi, Ali
Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **D** *CM DC voltage*

KR/CR chips are defiend with common mode of 0.2 V to 1.0 V, there is no reason to define the same host with such high common mode

SuggestedRemedy

Reduce common mode min to 0.2 V and common mode max to 1.0 V

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **120G** *SC* **120G.3.3.2** *P* **232** *L* **17** # 250

Dawe, Piers
Nvidia

Comment Type **TR** *Comment Status* **A** *TP1 EH*

The module NE and FE minimum EH should not be the same (see another comment). If we stay with the 2-settings module specification, even if corrected with a 4-loss specification method, this should be reflected in this table, which should include near-end parameters anyway.

SuggestedRemedy

Add the rows for the near-end parameters.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Some comments are proposing to remove EW as a parameter.

Add rows for NE EH, EW (if EW is not removed as a result of other comments), and VEC to Table 120G-6 with values the same as for NE EH, EW, and VEC, respectively, as specified at TP4 (module output).

Cl **120G** *SC* **120G.3.3.2** *P* **232** *L* **18** # 100

Brown, Matt
Huawei

Comment Type **T** *Comment Status* **A** *ew/esmw (bucket5)*

In Table 120G-6 for host input stressed signal the value for eye width is TBD.

SuggestedRemedy

Replace TBD with an appropriate value.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Resolve this comment using the response to comment #41.

Cl **120G** SC **120G.3.3.2** P **232** L **18** # 101

Brown, Matt Huawei

Comment Type **T** *Comment Status* **A** *ew/esmw (bucket5)*

In Table 120G-6 for host input stressed signal there are specifications for both far-end eye symmetry mask width (ESMW) and eye width (EW). ESMW is not mentioned in the stressed input procedure nor does it seem relevant.

SuggestedRemedy

Delete ESMW row in Table 120G-6.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Resolve this comment using the response to comment #41.

Cl **120G** SC **120G.3.3.2** P **232** L **18** # 211

Ran, Adee Intel

Comment Type **T** *Comment Status* **A** *ew/esmw (bucket5)*

Eye width is only a parameter of host stressed input specification (Table 120G-6). There is no corresponding parameter in the module output signal.

Similarly in module stressed input (Table 120G-9).

Creating a special condition for the stress signal is burdensome for the test setup, and is not justified if there is no such specification for output signal.

SuggestedRemedy

Delete the eye width rows in tables 120G-6 and 120G-9.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Resolve this comment using the response to comment #41.

Cl **120G** SC **120G.3.3.2** P **232** L **23** # 191

Calvin, John Keysight Technologies

Comment Type **T** *Comment Status* **R** *TP1 VEC*

Based on Hadrien/Garg/Calvin presentation https://www.ieee802.org/3/ck/public/adhoc/sept23_20/louchet_3ck_adhoc_01a_092320.pdf it is illustrated that the Host stressed Far-end vertical eye closure of 7.5dB, cannot be realized with contemporary instrumentation. The current choice of MTF channel losses and sinusoidal impairments records a VEC on the order of 9.5dB.

SuggestedRemedy

Update the target Far-end vertical eye closure VEC in Table 120G-6 from 7.5dB to 9.5dB. Alternately asserting this 7.5dB VEC target without typical margining (SJ) impairments is allowable to reach a VEC of 7.5dB.

Response *Response Status* **C**

REJECT.

The following presentation was reviewed by the task force: https://www.ieee802.org/3/ck/public/20_10/calvin_3ck_02a_1020.pdf

The suggested remedy proposes to address a limitation in the test equipment or method by increasing the specified value. This would result in tightening receiver specifications and loosening transmitter specifications.

More justification for the proposed changes is required.

Cl **120G** SC **120G.3.3.2.1** P **232** L **33** # 251

Dawe, Piers Nvidia

Comment Type **T** *Comment Status* **A** *RJT (bucket1)*

This sentence refers to the SJ table but doesn't tell the reader what to do. Other clauses and annexes with similar tables say that the entries are used one at a time (you don't apply all the SJ tones at once).

SuggestedRemedy

Please make this explicit.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement the suggested remedy with editorial license using wording similar to that used in 162.9.4.4.2.

Cl **120G** *SC* **120G.3.3.2.1** *P* **233** *L* **32** # 103

Brown, Matt — Huawei

Comment Type **T** *Comment Status* **R** *crosstalk*

For the host stressed input the crosstalk source transition parameters are TBD as follows: "The counter propagating crosstalk signals during calibration of the stressed signal are asynchronous with target amplitude of TBD mV peak-to-peak differential and 20% to 80% target transition time of TBD ps as measured at TP1a (without the use of a reference receiver)." Set amplitude to the host output maximum value and set the transition time to the host output minimum value.

SuggestedRemedy

Change the sentence to the following:
"The counter propagating crosstalk signals during calibration of the stressed signal are asynchronous with target amplitude of 870 mV peak-to-peak differential and 20% to 80% target transition time of 7.5 ps as measured at TP1a (without the use of a reference receiver)."

Response *Response Status* **C**

REJECT.

[Editor's note: Addresses incomplete specification.]

The proposed transition time is much smaller than would be expected. Further analysis and proposal is required.

There is no consensus to make any changes at this time.

Cl **120G** *SC* **120G.3.3.2.1** *P* **233** *L* **43** # 252

Dawe, Piers — Nvidia

Comment Type **T** *Comment Status* **A** *TP4 settings*

"Meeting the BER requirements at only one of the methods is sufficient": not quite. The host needs to choose right as well.

SuggestedRemedy

If the 2-settings method is kept, say that meeting the BER requirements at the one of the two methods that the host selects is sufficient.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

With editorial license, include text to indicate that for the host input stressed eye the host selects the TX eq state and the calibration is done appropriately, specifically for long state use FE stress and for short state use NE stress.

Cl **120G** *SC* **120G.3.3.2.1** *P* **233** *L* **49** # 253

Dawe, Piers — Nvidia

Comment Type **T** *Comment Status* **A** *(bucket1)*

120E.3.2.1.2

SuggestedRemedy

120G.5.3, if it remains - or delete the sentence. I believe the other specs mean that the following sentence "Pre-emphasis capability is likely to be required in the pattern generator to meet this requirement." would still apply.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace the reference to 120E.3.2.1.2 with a reference to 120G.5.3.

Cl **120G** *SC* **120G.3.4** *P* **235** *L* **11** # 104

Brown, Matt — Huawei

Comment Type **T** *Comment Status* **R** *ERL value (bucket5)*

The module input ERL value is TBD.

SuggestedRemedy

Replace TBD with an appropriate value.

Response *Response Status* **C**

REJECT.

[Editor's note: Addresses incomplete specification.]

The response to closed comment #114 indicates that there was no consensus to make the changes proposed in this comment.

Cl **120G** *SC* **120G.3.4** *P* **235** *L* **18** # 149

Ghiasi, Ali — Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **D** *CM DC voltage*

KR/CR chips are defiend with common mode of 0.2 V to 1.0 V, there is no reason to define the same host to have such large output common mode voltage. If the CDR in the module is BiCMOS and uses 3.3 V then one will use the right voltage rating but if the CDR in the module is CMOS then one doesn't need to use 3.3V+ DC blocks.

SuggestedRemedy

Reduce common mode min to 0.2 V and common mode max to 1.0 V

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **120G** *SC* **120G.3.4.1** *P* **231** *L* **35** # 105

Brown, Matt Huawei

Comment Type **T** *Comment Status* **A** *ew/esmw (bucket5)*

In Table 120G-9 for module input stressed signal the value for eye width is TBD.

SuggestedRemedy

Replace TBD with an appropriate value.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Resolve this comment using the response to comment #41.

Cl **120G** *SC* **120G.3.4.1** *P* **235** *L* **34** # 106

Brown, Matt Huawei

Comment Type **T** *Comment Status* **A** *ew/esmw (bucket5)*

In Table 120G-9 for host input stressed signal there are specifications for both far-end eye symmetry mask width (ESMW) and eye width (EW). ESMW is not mentioned in the stressed input procedure nor does it seem relevant.

SuggestedRemedy

Delete ESMW row in Table 120G-6.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Changed subclause, page, and line number from 120G.3.3.2, 232, and 18.]

[Editor's note: Addresses incomplete specification.]

The commenter indicated that the suggested remedy should refer to Table 120G-9 rather than Table 120G-6.

Resolve this comment using the response to comment #41.

Cl **120G** *SC* **120G.3.4.1** *P* **235** *L* **40** # 192

Calvin, John Keysight Technologies

Comment Type **T** *Comment Status* **R** *TP4a VEC*

Based on Hadrien/Garg/Calvin presentation https://www.ieee802.org/3/ck/public/adhoc/sept23_20/louchet_3ck_adhoc_01a_092320.pdf it is illustrated that the Module stressed input test VEC (max) value of 9.5dB, cannot be realized with contemporary instrumentation. The current choice of MTF channel losses and sinusoidal impairments records a VEC on the order of 13dB.

SuggestedRemedy

Update the target VEC max in Table 120G-9 from 9.5dB to 13dB. Alternately asserting this 9.5dB target VEC should be attainable with either a lower loss C2M test channel, or without typical margining (SJ) impairments is allowable to reach a VEC of 9.5dB.

Response *Response Status* **C**

REJECT.

Resolve using the response to comment #191.

Cl **120G** *SC* **120G.3.4.1.1** *P* **236** *L* **15** # 107

Brown, Matt Huawei

Comment Type **T** *Comment Status* **A** *TP4a transition time*

For the module input stressed eye, the pattern generator transition time value is TBD as follows:
"The target pattern generator 20% to 80% transition time at the input to the test channel in the module stressed input test is TBD ps."

SuggestedRemedy

Replace TBD with 7.5 ps.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Change TBD to 9 ps.

Cl **120G** *SC* **120G.3.4.1.1** *P* **236** *L* **47** # 108

Brown, Matt
Huawei

Comment Type **T** *Comment Status* **R** *TP4a crosstalk*

The parameter values for the module input eye opening crosstalk source are TBD as follows:
"The counter propagating crosstalk signals during calibration of the stressed signal are asynchronous with target amplitude of TBD mV peak-to-peak differential and target slew time between –TBD mV and TBD mV of TBD ps as measured at TP4 (without the use of a reference equalizer)."
Use the maximum peak to peak value from Table 120G-3, range of 20% to 80%, and minimum transition time from Table 120G-3 (value proposed in another comment).

SuggestedRemedy

Replace with the following:
The crosstalk generator is calibrated at TP4 (without the use of a reference receiver) with target differential peak-to-peak amplitude of 900 mV and slew time of 7.5 ps between –270 V and +270 V.

Response *Response Status* **C**

REJECT.

[Editor's note: Addresses incomplete specification.]

The proposed transition time is smaller than would be expected. Further analysis and proposal is required.

There is no consensus to make any changes at this time.

Cl **120G** *SC* **120G.3.4.1.1** *P* **237** *L* **14** # 109

Brown, Matt
Huawei

Comment Type **T** *Comment Status* **A** *TP4a criteria*

For the module input stressed eye high-loss case the criteria to have CTLE setting greater than a certain value is not relevant because: (a) there are two gain parameters and (b) the reference receiver includes a DFE. Regardless, the minimum CTLE setting value is TBD.

SuggestedRemedy

Either:
(a) delete the following text:
"This CTLE setting has to be greater than or equal to TBD dB." on line 13, and
"except that the restriction that the CTLE setting has to be greater than or equal to TBD dB does not apply" on line 18
OR
(b) provide an alternate relevant criteria.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Replace the sentence with the following:
"The CTLE setting, gdc+gdc2, has to be less than or equal to -13 dB."

Cl **120G** *SC* **120G.3.4.1.1** *P* **237** *L* **14** # 254

Dawe, Piers
Nvidia

Comment Type **T** *Comment Status* **A** *TP4a criteria (bucket6)*

"This CTLE setting has to be greater than or equal to TBD dB": with a compound CTLE, it's not as simple as that.
The limits should be close to that for TP4 FE in Table 120G-14, but might not be identical.

SuggestedRemedy

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Resolve using the response to comment #109.

Cl **120G** *SC* **120G.4.1** *P* **238** *L* **34** # 255

Dawe, Piers
Nvidia

Comment Type **T** *Comment Status* **A** *Channel IL*

I'm sure there could be an acceptable channel that failed this mask at 45 GHz

SuggestedRemedy

Make the straight section curve down and/or truncate it at 50 GHz

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

It makes sense to align the high-frequency limit with channel IL specifications in 162, 163, and/or 120F. However, even those are inconsistent.
162 specifies 40 GHz.
163 specifies 45 GHz.
120F specifies 53.125 GHz.

Change the upper frequency limit of the informative channel loss for 163, 120F, and 120G to 40 GHz.

Cl **120G** *SC* **120G.5.1** *P* **238** *L* **51** # 207

Ran, Adee
Intel

Comment Type **E** *Comment Status* **A** *(bucket1)*

Cross reference to 120E.3.1 is inaccurate

SuggestedRemedy

Change to 120E.3.1.2

Response *Response Status* **C**

ACCEPT.

Cl **120G** *SC* **120G.5.2** *P* **240** *L* **10** # 256

Dawe, Piers
Nvidia

Comment Type **T** *Comment Status* **R** *RR parameters*

By allowing stronger gDC with stronger gDC2, we can have up to 12 dB of peaking for gCD2 = -1 but up to 16 dB for gDC2 = -3 - yet we don't expect the maximum channel loss to vary like that.

SuggestedRemedy

I think we should be allowing stronger gDC with weaker gDC2, for TP1a and for TP4 far end.

Response *Response Status* **C**

REJECT.

The comment does not provide sufficient evidence to make the proposed changes and the suggested remedy does not provide sufficient detail to to implement.

Some support was expressed during comment resolution however a detailed proposal is required.

Cl **120G** *SC* **120G.5.2** *P* **241** *L* **10** # 206

Ran, Adee Intel

Comment Type **T** *Comment Status* **R** *EO method*

In item c the linear fit is performed "with parameter M the same as for step a)" - but in step a there is no mention of M.

If M corresponds to "a minimum of 3 samples per symbol" then this is too low for calculation of a linear fit and especially for obtaining t_s.

In the PMD clauses, for linear fit, M is required to be at least 32, and interpolation can be used. The third paragraph of 162.9.3.1.1 (which is referenced here) states this clearly, so no explicit statement is required.

SuggestedRemedy

Delete "with parameter M the same as for step a)".

Response *Response Status* **C**

REJECT.

Item a) previously referenced the capture method in 162.9.3.1.1 which specified M to be at least 32. This capture method was replaced with the method in 120E.4.2, which specifies a minimum of 3 samples per symbol. The intent of keeping M the same in both the capture and the linear fit is to ensure a correspondence of the sample time derived from the linear fit.

A detailed proposal to address this comment is required.

There is no consensus to implement the proposed remedy at this time.

Cl **120G** *SC* **120G.5.2** *P* **241** *L* **14** # 210

Ran, Adee Intel

Comment Type **T** *Comment Status* **A** *ew/esmw (bucket5)*

"Compute the receiver input signal yrx(k) by applying the effect of the DFE to y2(k) using the
sampling phase ts and tap weights b(n) determined in the previous step"

It is not specified fully how the effect of the DFE is applied. Different methods can result in different eye shape. Although EH and VEC are not affected, if EW or ESMW spec are retained they will depend on the DFE application, so it needs to be specified unambiguously.

SuggestedRemedy

If ESMW and EW specifications are not removed, Change the quoted statement to

"Compute the receiver input signal yrx(k) by adding the output of a DFE with tap weights b(n) determined in the previous step to y2(k). The DFE output is a piecewise-constant signal with transitions occurring at t_s + UI/2".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Resolve this comment using the response to comment #41.

Cl **120G** *SC* **120G.5.2** *P* **241** *L* **23** # 102

Brown, Matt Huawei

Comment Type **T** *Comment Status* **A** *ew/esmw (bucket5)*

For each C2M interface, there is a specification for eye symmetry mask width (ESMW) and there is a pointer to 120G.5.2. However, 120G.5.2 does not specifiy a method for ESMW; it specifies a method only EH, EW, and VEC. ESMW is discussed in 120E.4.2, but even there its not really clear what to do with it.

SuggestedRemedy

Add methodology for ESMW and explain the relevance.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Resolve this comment using the response to comment #41.

Cl **120G** *SC* **120G.5.2** *P* **241** *L* **27** # 257

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **A** *ew/esmw (bucket5)*

We can't pass the signal when it passes EH but fails EW / ESMW, but it might be OK at another setting. Note this does not require optimising for EW, only rejecting candidate solutions that fail EW (constraint not goal). We did this in 120E, nothing new here.
Pre-cursor ISI ratio would be a constraint too if it remains.

SuggestedRemedy

Change:
where eye height also complies with the specification for eye height (min) as specified for the interface.
to:
where the eye also complies with the specifications for eye height, ESMW, and eye width if applicable, as specified for the interface.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve this comment using the response to comment #41.

Cl **120G** *SC* **120G.5.3** *P* **241** *L* **31** # 150

Ghiasi, Ali Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **A** *precursor ISI ratio*

Pre-cursor ISI was added in 802.3bs when we did not have VEC, several people have questioned if pre-cursor ISI is need. No has shown why we need to keep pre-cursor ISI, just it might be usefull.

SuggestedRemedy

Given than no one has shown pre-cursor ISI needed then we should remove

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Since no value has been proposed or even discussed, it seems that this parameter is of low importance.
With editorial license, remove pre-cursor ISI specifications.

Cl **120G** *SC* **120G.5.3** *P* **241** *L* **34** # 258

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **A** *precursor ISI ratio (bucket4)*

The valid setting would have to satisfy eye width / ESMW too.

SuggestedRemedy

Modify the definition of valid setting or delete the subclause.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #150.

Cl **120G** *SC* **120G.5.3** *P* **241** *L* **37** # 259

Dawe, Piers Nvidia

Comment Type **T** *Comment Status* **A** *precursor ISI ratio (bucket4)*

The pulse peak is not at the same time as the DFE sampling phase ts determined in step d of 120G.5.2, but it's close. No need for both.

SuggestedRemedy

Change from pmax to the pulse at the DFE sampling phase ts, or delete the subclause.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #150.

Cl **120G** *SC* **120G.6.3** *P* **243** *L* **29** # 185

Maki, Jeffery — Juniper Networks

Comment Type **T** *Comment Status* **A** *(bucket1p)*

Major capability/option for the host is missing that is already listed for the module.

SuggestedRemedy

Add row to table with Item = ADE-H; Feature = Adaptive Equalization; Subclause = 120G.3.3; Value/Comment = See 120G.3.3; Status = M; Support = Yes [ ].

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The capability is specified in 120G.3.3, but has not yet been listed in the PICS.

A PICS item for a similar requirements against the module input (see 120G.3.4)

Implement the suggested remedy with editorial license, except insert the new item ahead of RH1 in the table in 120G.6.4.3.

Also, move the PICS item ADE from 120G.6.3 to 120G.6.4.4. Implement with editorial license.

Cl **120G** *SC* **120G.6.3** *P* **243** *L* **30** # 184

Maki, Jeffery — Juniper Networks

Comment Type **T** *Comment Status* **A** *C2M modes*

Major capability/option for the module is missing.

SuggestedRemedy

Add one row to the table. (1) with Item = EQ; Feature = (100GAUI-1-S and 100GAUI-1-L) or (200GAUI-2-S and 200GAUI-2-L) or (400GAUI-4-S and 400GAUI-4-L); Subclause = 120G.3.2.1; Value/Comment = See 120G.3.2.1; Status = M; Support = Yes [ ].

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #182.

Cl **135** *SC* **135.5.1** *P* **106** *L* **45** # 215

Dawe, Piers — Nvidia

Comment Type **TR** *Comment Status* **A** *(bucket1)*

These AUI specifications are alternatives

SuggestedRemedy

Change "and" to "or". Also in the next paragraph.

Response *Response Status* **C**

ACCEPT.

Cl **162** *SC* **162.1** *P* **133** *L* **17** # 46

Ran, Adee — Intel

Comment Type **E** *Comment Status* **A** *(bucket1)*

Incorrect cross reference "Figure 162-3"

SuggestedRemedy

Change to "Table 162-3"

Response *Response Status* **C**

ACCEPT.

Cl **162** *SC* **162.5** *P* **137** *L* **19** # 120

Kocsis, Sam — Amphenol

Comment Type **TR** *Comment Status* **R** *medium delay*

one-way delay no more than "14ns"

SuggestedRemedy

one-way delay no more than "16ns", for consistency with ERL parameter values

Response *Response Status* **C**

REJECT.

The following presentations was reviewed by the task force:
https://www.ieee802.org/3/ck/public/20_10/kocsis_3ck_01a_1020.pdf

Insufficient evidence to make the proposed change was provided. Increasing the medium delay allocation reduces the delay allocated to the PMD.

There is no consensus to make the proposed change.

Cl **162** *SC* **162.7** *P* **138** *L* **41** # 216

Dawe, Piers — Nvidia

Comment Type **E** *Comment Status* **A** *(bucket1)*

Blank line(s)

SuggestedRemedy

Remove. Also before tables 162-6 and 7.

Response *Response Status* **C**

ACCEPT.

Cl **162** *SC* **162.8.11** *P* **144** *L* **16** # 1

Lusted, Kent — Intel Corporation

Comment Type **TR** *Comment Status* **A** *PMD control*

In the IEEE 802.3cd-2018 project, an updated PMD Control Function (i.e. link training) was defined and specified in Cl 136.8.11.
Among other things, specific changes enabled the link training protocol to support link establishment between two devices without using Cl 73 Auto-Negotiation (i.e. for the customer use case of “forced PHY speed” on the link).

The currently defined state machine in Clause 136.8.11 (Figure 136-7) does not autonomously recover from a partner breaking frame lock during link training (Note: observed when the Clause 73 Auto-Negotiation state machine is not used.) Unless a high-level management agent (i.e. SW or FW) detects the condition, the result could be either a link down (i.e. link never comes up) or a link oscillation (up/down/up/down/etc). One reason is that the signals local_tf_lock and remote_tf_lock are only checked moving from the SEND_TF state to the TRAIN_LOCAL state. Another is that there is no clear indication between the two end points that the link has been restarted (without AN73 present). There are other reasons as well, not listed here.

SuggestedRemedy

Update the PMD control state diagram to account for this situation. Some solutions include, but are not limited to:
- increase the duration of the holdoff_timer to exceed that of the max_wait_timer (>= 12 seconds)
- add monitoring of the local and received frame lock status after the initial frame lock is achieved
- implement an abort signaling mechanism

See presentation to be submitted for TF consideration.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The following presentations were reviewed by the task force:
https://www.ieee802.org/3/ck/public/20_10/lusted_3ck_01_1020.pdf
https://www.ieee802.org/3/ck/public/20_10/lusted_3ck_02_1020.pdf

Based on straw poll #15, the preferred solution is Option B3.

Implement the option B3 in lusted_3ck_02_1020 with editorial license.

Strawpoll #15 (direction, choose one)
I support updating the 100G/lane PMD Control function as proposed in lusted_3ck_02_1020 using:
A. Option B3 (per slides 6, 8-9)
B. Option B4 (per slides 6, 11-13)
A: 15 B: 6

Cl **162** *SC* **162.9.3** *P* **146** *L* **24** # 151

Ghiasi, Ali — Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **R** *TX CM AC noise*

30 mV AC common mode results in 1+ dB of COM penalty, there is no technical bases for using such large amount of AC common mode

SuggestedRemedy

Reduce TX AC common mode from 30 mV to 15 mV RMS

Response *Response Status* **C**

REJECT.

Resolve using the response to comment #141.

Cl **162** *SC* **162.9.3** *P* **146** *L* **27** # 3

Mellitz, Richard — Samtec

Comment Type **TR** *Comment Status* **A** *ERL value (bucket5)*

The ERL range is between 7.3 dB and 18.8 for published channels that representative of 100G Host designs.

SuggestedRemedy

Set ERL (min) to 7.3 dB in Table 162.-10

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Resolve using the response to comment #114.

Cl **162** *SC* **162.9.3** *P* **146** *L* **42** # 47

Ran, Adee — Intel

Comment Type **T** *Comment Status* **A** *PMD control*

(CC)
for c(0), PRESET 2 in Table 162-11 has a value of 0.5 (+/-half of a step). To enable this value, the maximum value at minimum state should be no higher than 0.5.

Change should also be applied in 162.9.3.1.5.

Also applies to KR, Table 163-5 (163.9.2) and to AUI-C2C, Table 120F–1 (120F.3.1.1) which should work over lower-loss channels.

SuggestedRemedy

Change 0.54 to 0.5, in all places listed in the comment.

Response *Response Status* **C**

ACCEPT.

[Editor's note: CC: 162, 163, 120F]

Cl **162** *SC* **162.9.3** *P* **146** *L* **48** # 48

Ran, Adee — Intel

Comment Type **T** *Comment Status* **A** *EO jitter (bucket5)*

(CC)
The even-odd jitter limit of 0.019 UI (less than 360 fs) was not met by several different transmitters tested in lab environment. The same parts showed good link performance over challenging channels.

This requirement seems difficult to meet and not too important for interoperability. It seems that much higher EOJ can be tolerated by existing receivers.

For reference, in multiple generations of NRZ PMDs the allowed EOJ is 0.035 UI; for C2M and for optical PMDs it is not defined at all.

Also applies to KR, Table 163-5 (163.9.2) and to AUI-C2C, Table 120F–1 (120F.3.1.1)

SuggestedRemedy

For parameter "Even-odd jitter, pk-pk" change "value" from 0.019 to 0.035, in all places listed in the comment.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #190.

[Editor's note: CC: 163, 120F]

Cl **162** *SC* **162.9.3** *P* **146** *L* **48** # 186

Calvin, John — Keysight Technologies

Comment Type **T** *Comment Status* **A** *EO jitter (bucket5)*

The spec limit for Even-Odd jitter is only 358 femtoseconds, which is too low to be accurately measured with current state of the art test equipment.

SuggestedRemedy

Increase the spec limit from 0.019 UI to 0.025 UI

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #190.

Cl **162** *SC* **162.9.3** *P* **147** *L* **1** # 49

Ran, Adee — Intel

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

Footnote d includes important information for measurement that should be stated in the test procedure, not as a comment on the table (it does not change the specification).

SuggestedRemedy

Delete footnote d and instead add an informative NOTE in 162.9.3.3 (which is referred to by clause 163 and should also be used for 120F).

Also delete footnote e in Table 163-5.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement the suggested remedy with editorial license in 163 and equivalently in 120F.

[Editor's note: CC: 163, 120F]

Cl **162** *SC* **162.9.3.1.2** *P* **149** *L* **6** # 124

Hidaka, Yasuo — Credo Semiconductor

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

The definition of steady-state voltgage vf in clause 136.9.3.1.2 uses the linear fit pulse p(k). The linear fit pulse p(k) is calculated with Dp=3 in clause 136, whereas it is calculated with Dp=4 in clause 162. It is not clear which procedure is used to calculate the linear fit pulse p(k).

SuggestedRemedy

Change "The steady-state voltage vf is defined in 136.9.3.1.2, and is determined using Nv=200."

to

"The steady-state voltage vf is defined in 136.9.3.1.2, and is determined using Nv=200 and linear fitted pulse p(k) calculated by the procedure in 162.9.3.1.1."

Response *Response Status* **C**

ACCEPT.

Cl **162** *SC* **162.9.3.1.4** *P* **149** *L* **43** # 50

Ran, Adee — Intel

Comment Type **E** *Comment Status* **A** *TX coefficients*

"When coef_sel is –3, –2, -1, 0, or 1," - the list includes all possible values, so there is no need for this phrase.

SuggestedRemedy

Delete the quoted phrase.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement the suggested remedy with editorial license.

Cl **162** *SC* **162.9.3.1.5** *P* **150** *L* **20** # 45

Slavick, Jeff — Broadcom

Comment Type **E** *Comment Status* **A** *TX coefficients (bucket1)*

The order of the ranges tests was +1, -1, -2, -3 prior to add 0, but we placed 0 at the end instead of in it's position in the descending list.

SuggestedRemedy

Move the requirement for testing c(0) range to be the third paragph (between +1 and -1)

Response *Response Status* **C**

ACCEPT.

Cl **162** *SC* **162.9.3.1.5** *P* **150** *L* **20** # 51

Ran, Adee Intel

Comment Type **E** *Comment Status* **A** *(bucket1)*

(0) is set in italics

SuggestedRemedy

set to upright

Response *Response Status* **C**

ACCEPT.

Cl **162** *SC* **162.9.3.1.5** *P* **150** *L* **20** # 44

Slavick, Jeff Broadcom

Comment Type **TR** *Comment Status* **A** *TX coefficients (bucket1)*

When testing how small you can make the signal there is no constraint on the other tap settings.

SuggestedRemedy

Add the following to the start of the sentence "With c(-3), c(-2), c(-1) and c(1) set to zero and c(0)"

Response *Response Status* **C**

ACCEPT.

Cl **162** *SC* **162.9.3.3** *P* **150** *L* **39** # 189

Calvin, John Keysight Technologies

Comment Type **T** *Comment Status* **A** *EO jitter (bucket5)*

Based on Sleigh/Calvin/LeCheminant presentation https://grouper.ieee.org/groups/802/3/ck/public/adhoc/sept16_20/calvin_3ck_adhoc_01_091620.pdf it has been shown that the EOJ measurement is susceptible to a systematic error based on the test pattern length and baud rate. This is easily resolved by allowing the CDR loop BW to be reduced below 4 MHz

SuggestedRemedy

Update the text of page 150 line 39 to read Even-odd jitter is calculated using the measurement method specified in 120D.3.1.8.2. with the exception that EOJ may be measured with a clock recovery unit (CRU) with a corner frequency of <= 4 MHz and a slope of 20 dB/decade

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #190.

Cl **162** *SC* **162.9.3.3** *P* **150** *L* **40** # 52

Ran, Adee Intel

Comment Type **T** *Comment Status* **A** *EO jitter (bucket5)*

The method in 120D.3.1.8.2 is very specific about using PRBS13Q.

Physical measurements of even-odd jitter with PRBS13Q at 53.125 GBd show a much wider distribution and larger values compared with shorter test patterns.

Since even-odd jitter is inherently a high frequency effect (fb/2), this variability seems to be a measurement artifact. The considerations mentioned in NOTE 1 of 120D.3.1.8.2 may be limiting the accuracy of measurements at this signaling rate.

If a device can be tested with a shorter pattern which enables calculation of even-odd jitter, the measurement can be made more accurate; such results should be acceptable.

The comment also applies to 120F.3.1.3.

SuggestedRemedy

Add the following exception in 162.9.3.3:

The pattern used for Even-odd jitter measurement may be PRBS13Q or any shorter odd-length pattern that includes the 12 possible transitions between two different PAM4 symbols.

In 120F.3.1.3, change the cross-reference for EOJ measurement from 120D.3.1.8.2 to 162.9.3.3.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #190.

[Editor's note: CC: 120F, 162]

Cl **162** *SC* **162.9.3.4** *P* **151** *L* **12** # 217

Dawe, Piers — Nvidia

Comment Type **T** *Comment Status* **A** *ERL tfx (bucket5)*

Both the parameter description and the note are incorrect: "Twice the propagation delay associated with the test fixture", "The specified Tfx value represents twice the transmission line delay which sufficiently mitigates the test point and transmission line return loss."
And the terminology doesn't match: propagation delay, transmission line delay - are they the same thing or what?

SuggestedRemedy

Tfx is windowing time that is larger than twice the delay associated with the test point connector but less than twice the delay from the test point connector to the other end of the test fixture's transmission line.
Also Tfx needs to appear in 93A.5, which is where the explanation should go, not here.
Make similar changes in each ERL section in the draft.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Rename the Tfx parameter to "Time-gated propagation delay".

With editorial license, add Tfx to Table 93A-4 and modify 93A-5 explanation of Tfx recognizing variation between clauses that invoke the method.

Given IEEE Standards Style manual, convert footnote to informative note.

Modify the note text from “the specified Tfx value represents twice the transmission line delay which sufficiently mitigates the test point and transmission line return loss” to “The specified Tfx value represents a propagation delay which sufficiently mitigates the effect of reflections from the test connector and test fixture transmission line” or otherwise appropriate given 93A description."

Implement across clauses with editorial license.

[Editor’s note: CC: 162, 163, 120F, 120G, 93A]

Cl **162** *SC* **162.9.3.4** *P* **151** *L* **16** # 157

Dudek, Mike — Marvell.

Comment Type **E** *Comment Status* **A** *ERL tfx (bucket5)*

The wording in the footnote doesn't properly describe what is being mitigated. In particular what is "the test point and transmission line". A test point doesn't have a return loss.

SuggestedRemedy

Change " which sufficiently mitigates the test point and transmission line return loss." to "which sufficiently mitigates the effect of reflections from the test connector and test fixture transmission line". Also on the footnote to table 162-17 on page 157 line 15

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #176.

Cl **162** *SC* **162.9.3.5** *P* **150** *L* **50** # 218

Dawe, Piers — Nvidia

Comment Type **TR** *Comment Status* **A** *CM RL/noise*

1. This paragraph complains about issues from mixed-mode conversion then claims that "a minimum common-mode to common-mode return loss is required". It's misinformation.
2. This is a standard, not an attempt at a textbook. We don't give any justifications for most other specs; there is no reason that this one should be different.
3. For those interested: this 2 dB CM LR spec is there to contain a gross build-up of CM voltage. It's ineffective in the context of mixed-mode where the specs are around 10-20 dB. But we don't need to discuss it in the draft.

SuggestedRemedy

Delete the paragraph

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #156.

Cl **162** *SC* **162.9.3.5** *P* **150** *L* **50** # 156

Dudek, Mike — Marvell.

Comment Type **T** *Comment Status* **A** *CM RL/noise*

The description here is not helpful. This is the common-mode to common mode return loss of the Tx. Also a value of 2dB hardly "limits" this affect it just helps and if it were really "required" it would need to be a much larger value.

SuggestedRemedy

Change the paragraph "Common-mode signal can be generated in the channel by conversion of a differential signal. Any commonmode signal returned into the channel can be converted back to a differential signal and result in differential noise into the receiver. To limit this effect, a minimum common-mode to common-mode return loss is required."
to "Common-mode signals can be returned to the transmitter by differential to common mode reflections of the cable or receiver. Any commonmode signal reflected back into the channel by the transmitter can be converted to a differential signal and result in differential noise into the receiver. To reduce this effect a minimum common-mode to common-mode return loss is specified."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement the suggested remedy with editorial license.

Cl **162** *SC* **162.9.4** *P* **151** *L* **37** # 152

Ghiasi, Ali — Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **R** *RX CM AC noise*

Receiver specifications at TP3 must include max AC common mode

SuggestedRemedy

Add max AC commonm mode 17.5 mV to the table

Response *Response Status* **C**

REJECT.

Resolve using the response to comment #142.

Cl **162** *SC* **162.9.4** *P* **151** *L* **44** # 4

Mellitz, Richard — Samtec

Comment Type **TR** *Comment Status* **A** *ERL value (bucket5)*

The ERL range is between 7.3 dB and 18.8 for published channel that representative of 100G Host designs.

SuggestedRemedy

Set ERL (min) to 7.3 dB in Table 162.-13

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #114.

Cl **162** *SC* **162.9.4.3** *P* **152** *L* **32** # 131

Ghiasi, Ali — Ghiasi Quantum/Inphi

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

Given that for low loss cable the loss is controlled to 1 dB, we should do the same for high loss cable

SuggestedRemedy

Increase the cable assembly test case min loss from 17.75 to 18.75 dB

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **162** *SC* **162.9.4.3.5** *P* **154** *L* **38** # 219

Dawe, Piers — Nvidia

Comment Type **E** *Comment Status* **A** *RITT (bucket1)*

The FEC symbol error ratio requirement assumes errors are

SuggestedRemedy

The FEC symbol error ratio requirement assumes that errors are

Response *Response Status* **C**

ACCEPT.

Cl **162** *SC* **162.9.4.4.2** *P* **155** *L* **6** # 220

Dawe, Piers Nvidia

Comment Type **E** *Comment Status* **A** *(bucket1)*

Table 120D-7

SuggestedRemedy

Table 162-15

Response *Response Status* **C**

ACCEPT.

Cl **162** *SC* **162.9.4.5** *P* **155** *L* **37** # 158

Dudek, Mike Marvell.

Comment Type **E** *Comment Status* **A** *(bucket1)*

Erroneous "be"

SuggestedRemedy

Change "shall be meet the" to "shall meet the" Also on page 157 line 43.

Response *Response Status* **C**

ACCEPT.

Cl **162** *SC* **162.11** *P* **156** *L* **18** # 129

Ghiasi, Ali Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **R** *AC coupling*

802.3cd standards specified 50 kHz AC coupling but this standard is operating 2x the Baudrate

SuggestedRemedy

Replace 50 KHz with 100 kHz

Response *Response Status* **C**

REJECT.

The AC-coupling specification is used throughout 802.3ck and applied to predictive models as well as implemented in 802.3cd cable assemblies. The comment does not provide sufficient evidence for the proposed changed.

Cl **162** *SC* **162.11** *P* **156** *L* **19** # 130

Ghiasi, Ali Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **R** *AC coupling*

If the AC coupling needs to be 50 KHz or 100 KHz why are we defining capacitor value, actually 100 nF results in 32 KHz cut off

SuggestedRemedy

Remove recommended AC coupling value

Response *Response Status* **C**

REJECT.

Resolve using the response to comment #129.

Cl **162** *SC* **162.11** *P* **156** *L* **37** # 110

Champion, Bruce TE Connectivity

Comment Type **T** *Comment Status* **R** *ERL value (bucket5)*

Cable Assembly ERL listed as TBD in Table 162-16

SuggestedRemedy

TBD to be changed to 7.4 dB. See presentation

Response *Response Status* **C**

REJECT.

[Editor's note: Addresses incomplete specification.]

The response to closed comment #114 indicates that there was no consensus to make the changes proposed in this comment.

Cl **162** *SC* **162.11** *P* **156** *L* **37** # 114

Kocsis, Sam — Amphenol

Comment Type **TR** *Comment Status* **A** *ERL value*

Minimum cable assembly ERL = TBD

SuggestedRemedy

Change to "7.4dB", see background/consensus presentation

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

The following presentations were reviewed by the task force:
https://www.ieee802.org/3/ck/public/20_10/kocsis_3ck_01a_1020.pdf
https://www.ieee802.org/3/ck/public/20_10/wu_3ck_02_1020.pdf

Additional presentations were posted for review:
https://www.ieee802.org/3/ck/public/20_10/champion_3ck_02_1020.pdf
https://www.ieee802.org/3/ck/public/20_10/wu_3ck_03_1020.pdf
https://www.ieee802.org/3/ck/public/20_10/wu_3ck_04_1020.pdf

ERL parameter and value comments were discussed together by reviewing
https://www.ieee802.org/3/ck/public/20_10/kochuparambil_3ck_03b_1020.pdf

There was no consensus to change the parameters values shown in red with strikethrough or the ERL value for the cable assembly.

Implement with editorial license the parameter values proposed in red without strikethrough in slide 3 of kochuparambil_3ck_03b_1020 with the exception of the cable assembly ERL value.

Cl **162** *SC* **162.11** *P* **156** *L* **39** # 15

DiMinico, Christopher — MC Communications

Comment Type **TR** *Comment Status* **A** *CA RLDC*

Provide specifications for Differential to common-mode return loss 162.11.4

SuggestedRemedy

Replace TBD with equation reference in Table 162–16—Cable assembly characteristics summary.

Add text and equation 162.11.4 Differential to common-mode return loss

The differential to common-mode return loss, in dB, of the cable assembly shall meet Equation (xx)
CDRL(f)>/=
22-10*f/26.56, 0.05 </= f </= 26.56
15-3*f/26.56, 26.56< f </= 40
Where
f is the frequency in GHz
See supporting presentation diminico_3ck_1020.pdf

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

The task force reviewed slide 4 in the following presentation:
https://www.ieee802.org/3/ck/public/20_10/diminico_3ck_01_1020.pdf

Implement suggested remedy with editorial license.

Cl **162** *SC* **162.11.2** *P* **157** *L* **8** # 173

Haser, Alex
Molex

Comment Type **TR** *Comment Status* **A** *CA IL*

The minimum IL is too strict to allow 0.5m 30awg cables (see support slide); need to relax min IL limit

SuggestedRemedy

More work needed to determine what the mask should be

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The following related presentation was reviewed by the task force:
https://www.ieee802.org/3/ck/public/20_10/diminico_3ck_04_1020.pdf

Implement with editorial license the insertion loss equation including frequency limits as provided on slide 4 of diminico_3ck_04_1020.

Cl **162** *SC* **162.11.2** *P* **157** *L* **10** # 174

Haser, Alex
Molex

Comment Type **TR** *Comment Status* **A** *CA IL (bucket5)*

Fill in TBD. Low freqeuncy cable loss can't vary wildly if the cable works at higher freuqencies; no need to over-spec

SuggestedRemedy

Replace TBD with 0.05GHz

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Resolve using the response to comment #173.

Cl **162** *SC* **162.11.2** *P* **157** *L* **10** # 17

DiMinico, Christopher
MC Communications

Comment Type **TR** *Comment Status* **A** *CA IL (bucket5)*

Replace TBD

SuggestedRemedy

Replace TBD with 0.05

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Resolve using the response to comment #173.

Cl **162** *SC* **162.11.2** *P* **157** *L* **26** # 221

Dawe, Piers
Nvidia

Comment Type **TR** *Comment Status* **A** *CA IL (bucket5)*

This minimum loss curve bends the wrong way at high frequencies

SuggestedRemedy

Change the limit (Eq 162-10) so it becomes flatter at high frequencies

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the resonse to comment #173.

Cl **162** *SC* **162.11.3** *P* **157** *L* **40** # 159

Dudek, Mike — Marvell.

Comment Type **E** *Comment Status* **A** *wording (bucket6)*

mixture of singular "ERL" with plural "are"

SuggestedRemedy

Change "are" to "is"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change:
"ERL of the cable assembly at TP1 and at TP4 are"
To:
"Values of ERL of the cable assembly at TP1 and at TP4 are"

Change:
"Cable assembly ERL at TP1 and at TP4 shall"
To:
"Values of cable assembly ERL at TP1 and at TP4 shall"

Cl **162** *SC* **162.11.3** *P* **157** *L* **43** # 132

Ghiasi, Ali — Ghiasi Quantum/Inphi

Comment Type **ER** *Comment Status* **A** *(bucket1)*

..shall be meet ..

SuggestedRemedy

should be …shall meet….

Response *Response Status* **C**

ACCEPT.

Cl **162** *SC* **162.11.3** *P* **157** *L* **44** # 133

Ghiasi, Ali — Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **A** *CA IL (bucket1)*

Given that for low loss cable the loss is controlled to 1 dB, we should do the same for high loss cable

SuggestedRemedy

The intention of this statement is not clear! Does it mean that if COM >=4 dB then no need to meet ERL?

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #132.

Cl **162** *SC* **162.11.3** *P* **158** *L* **9** # 113

Kocsis, Sam — Amphenol

Comment Type **TR** *Comment Status* **A** *ERL parameter (bucket5)*

CR ERL parameter N is "3500"

SuggestedRemedy

Change to "5100", see background/consensus presentation

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The following presentations was reviewed by the task force:
https://www.ieee802.org/3/ck/public/20_10/kocsis_3ck_01a_1020.pdf

Resolve using the response to comment #114.

Cl **162** *SC* **162.11.3** *P* **158** *L* **12** # 175

Haser, Alex — Molex

Comment Type **T** *Comment Status* **R** *ERL parameter (bucket5)*

Setting a single vlaue for fixture delay is not flexible enough to account for variation between test fixtures

SuggestedRemedy

Specify a range for fixture delay (e.g., 2ns +/- 10%)

Response *Response Status* **C**

REJECT.

The response to closed comment #114 indicates that there was no consensus to make the changes proposed in this comment.

Cl **162** *SC* **162.11.4** *P* **157** *L* **48** # 112

Champion, Bruce — TE Connectivity

Comment Type **T** *Comment Status* **A** *CA RLDC*

Cable assembly differential to common-mode return loss requirements are listed as TBD

SuggestedRemedy

A limit should be specified by an equation. It is recommended to use the equation for this parameter as shown on page 5 of diminico_3ck_02e_0720.pdf

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Resolve using the response to comment #15.

Cl **162** *SC* **162.11** *P* **156** *L* **41** # 16

DiMinico, Christopher MC Communications

Comment Type **TR** *Comment Status* **A** *CA ILDC*

Provide specifications for Differential to common-mode conversion loss 162.11.5

SuggestedRemedy

Replace TBD with equation reference in Table 162–16—Cable assembly characteristics summary.

Add text and equation 162.11.5 Differential to common-mode conversion loss

The difference between the cable assembly differential to common-mode conversion loss and the cable assembly insertion loss shall meet Equation (xx).
CDCL(f) - IL(f) >/=
10, 0.05 </= f </= 26.56
27-17*f/26.56, 26 < f </= 33.2
5.75, 33.2 < f </= 40
Where
f is the frequency in GHz
See supporting presentation diminico_3ck_1020.pdf

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Resolve using the response to comment #111.

Cl **162** *SC* **162.11.5** *P* **157** *L* **52** # 111

Champion, Bruce TE Connectivity

Comment Type **T** *Comment Status* **A** *CA ILDC*

Cable assembly differential to common-mode conversion loss requirements are listed as TBD

SuggestedRemedy

A limit should be specified by an equation. It is recommended to use the following equation for this limit:

SCD21(f)-SDD21(f) ≥ 10 for 0.05 ≤ f < 12.89
SCD21(f)-SDD21(f) ≥ 14 - 0.3108 * f for 12.89 ≤ f ≤ 40 GHz

f is frequency in GHz
SCD21(f) is the cable assembly differential to common-mode converion loss
SDD21 (f) is the cable assembly insertion loss

This limit is based on 5ps of skew (see presentation)

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

The following presentation was reviewed by the task force:
https://www.ieee802.org/3/ck/public/20_10/champion_3ck_01a_1020.pdf

Implement the equations and related figure in the suggested remedy with editorial license.

Strawpoll #16 (decision)
I support closing comments 111 and 16 implementing the suggested remedy for comment 111 with editorial license.
A: Yes
B: No
A: 18 B: 9

Cl **162** *SC* **162.11.3** *P* **158** *L* **15** # 176

Haser, Alex — Molex

Comment Type **ER** *Comment Status* **A** *ERL tfx (bucket5)*

The note about fixture delay is misleading. The specified delay does not represent twice the transmission line delay. Only the coax is being removed from the fixture.

SuggestedRemedy

Change footnote to: "The specified Tfx value signficantly mitigates the test point and transmission line return loss by removing the coax connector and via from the measurement." or something along those lines

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #217.

Cl **162** *SC* **162.11.6** *P* **158** *L* **23** # 222

Dawe, Piers — Nvidia

Comment Type **E** *Comment Status* **R** *CA RLCC*

This is a simple number; dressing it up as equation is a waste of time, and not how it's done in 163.

SuggestedRemedy

Similar to 162.9.3.5 and Table 163-5: change the contents of this subclause to: The common-mode to common-mode return of the cable assembly shall be within the limit given in Table 162-18 at all frequencies between 50 MHz and 40 GHz.
In Table 162-18, put "(min)" after "Common-mode to common-mode return loss" and replace "Equation (162-11)" with "2".

Response *Response Status* **C**

REJECT.

Mathmatical formulation succinct in expressing value and frequency range and consistent with associated equations.

Cl **162** *SC* **162.11.7** *P* **158** *L* **35** # 121

Kocsis, Sam — Amphenol

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

T_r is "7.5ps"

SuggestedRemedy

Change to "6.5ps", see background/consensus presentation

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **162** *SC* **162.11.7.1** *P* **160** *L* **52** # 223

Dawe, Piers — Nvidia

Comment Type **E** *Comment Status* **A** *CA XTALK (bucket1)*

93A.1.2.1 is in this draft now.

SuggestedRemedy

Reference to 93A.1.2.1 should be a hotlink to this draft.

Response *Response Status* **C**

ACCEPT.

Cl **162** *SC* **162.11.7.1.1** *P* **161** *L* **19** # 160

Dudek, Mike — Marvell.

Comment Type **T** *Comment Status* **A** *CA XTALK (bucket1)*

The wrong name is used and the equation reference is wrong.

SuggestedRemedy

Change "HOSTxP" to "HOSPT" Change Equation 162-12 on line 21 to Equation 162-10

Response *Response Status* **C**

ACCEPT.

Cl **162** *SC* **162.11.7.1.1** *P* **161** *L* **20** # 125

Hidaka, Yasuo — Credo Semiconductor

Comment Type **E** *Comment Status* **A** *CA XTALK (bucket1)*

The transmitter PCB signal path is denoted as S^(HOSPT).

SuggestedRemedy

Change "S^(HOSTxP)" to "S^(HOSPT)".

Response *Response Status* **C**

ACCEPT.

Cl **162** *SC* **162.11.7.1.1** *P* **161** *L* **23** # 224

Dawe, Piers — Nvidia

Comment Type **E** *Comment Status* **A** *(bucket1)*

=110.3

SuggestedRemedy

= 110.3 (insert space) as in 162.11.7.1.2, or use a word: "of" or "equals"?

Response *Response Status* **C**

ACCEPT.

Cl **162** *SC* **162.11.7.1.2** *P* **161** *L* **50** # 126

Hidaka, Yasuo — Credo Semiconductor

Comment Type **E** *Comment Status* **A** *CA XTALK (bucket1)*

The comment #127 for D1.2 was not correctly implemented.

The aggressor transmitter host PCB path was denoted as S^(HOTxSP) in clause 136.11.7.1.2, not S^(HOSTxP).

As wirtten in editor's note, the comment #128 for D1.2 had a conflict in the variable name in Equation (162-13) due to this implementation error.

I recommend to implement #127 and #128 for D1.2 and denote the aggressor transmitter host PCB path as S^(HOTxSP) for consistency with clause 136.11.7.1.2.

SuggestedRemedy

Change "S^(HOSTxP)" to "S^(HOTxSP)" in the following locations:

P161, line 50
P162, line 5, Equation (162-13)
P162, line 11
P162, line 16, Equation (162-14)
P162, line 22

Remove Editor's note.

Response *Response Status* **C**

ACCEPT.

Cl **162** *SC* **162.11.7.2** *P* **163** *L* **6** # 134

Ghiasi, Ali — Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **R** *MDI (bucket1)*

Some explantion is necessary for table 162-20

SuggestedRemedy

"A description would be helpful such as ""cable assemblies are constructed with identical MDI at each end of cable or could be constructed with different MDI for cable A vs B ends, see table .."""
In the table add A end and B end"

Response *Response Status* **C**

REJECT.

Description of the contents of Table 162-20 is given on line 1 of page 163.

Cl **162A** *SC* **162A.4** *P* **248** *L* **42** # 18

DiMinico, Christopher MC Communications

Comment Type **TR** *Comment Status* **A** *Host IL*

Replace TBD with equation

SuggestedRemedy

ILPCBmax(fGHz)=0.9809*(0.471*SQRT(f)+0.1194*f+0.002*(f^2))

for
0.01 GHz </= f </= 50 GHz
See supporting presentation diminico_3ck_1020.pdf

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Implement the suggested remedy.

See slide 7 supporting presention
https://www.ieee802.org/3/ck/public/20_10/diminico_3ck_01_1020.pdf

Cl **162A** *SC* **162A.4** *P* **249** *L* **39** # 19

DiMinico, Christopher MC Communications

Comment Type **TR** *Comment Status* **A** *Host IL*

Replace TBD with equation

SuggestedRemedy

ILHOST(f)=1.5658*(0.471*SQRT(f)+0.1194*f+0.002*(f^2))
for
0.01 GHz </= f </= 50 GHz
See supporting presentation diminico_3ck_1020.pdf

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Implement the suggested remedy.

See slide 8 of supporting presention
https://www.ieee802.org/3/ck/public/20_10/diminico_3ck_01_1020.pdf

Cl **162B** *SC* **162B.1.1.1** *P* **253** *L* **32** # 268

Dawe, Piers Nvidia

Comment Type **T** *Comment Status* **A** *TF wording*

I read "reference TP2 or TP3 test fixture insertion loss" as the insertion loss of a reference TP2 or TP3 test fixture. But I think it is the reference insertion loss of a TP2 or TP3 test fixture (similar to line 19).

SuggestedRemedy

It might be clearer to re-order "reference TP2 or TP3 test fixture insertion loss" to "TP2 or TP3 test fixture reference insertion loss", putting "reference" immediately before "insertion loss" as appropriate throughout 162B.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

With editorial license...
Replace:
"the reference TP2 or TP3 test fixture insertion loss"
With
"the TP2 or TP3 test fixture reference insertion loss"

Cl **162B** *SC* **162B.1.3.1** *P* **255** *L* **35** # 21

DiMinico, Christopher MC Communications

Comment Type **TR** *Comment Status* **A** *MTF IL*

Modify Equation (162B–3) ILMTFMAX > 40 GHz to align with achievable MTF insertion loss

SuggestedRemedy

See supporting presentation diminico_3ck_1020.pdf

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Slides 8 to 11 of the following presentation was reviewed:
https://www.ieee802.org/3/ck/public/20_10/diminico_3ck_03a_1020.pdf

The MAX IL mask proposed on slide 11 of diminico_03a relaxes IL at frequencies greater than 40 GHz.

Implement the ILMTFMAX specifications proposed on slide 11 of diminico_03a.

Cl **162B** *SC* **162B.1.3.1** *P* **256** *L* **12** # 269

Dawe, Piers — Nvidia

Comment Type **E** *Comment Status* **A** *MTF IL*

Figure 162B-3, Mated test fixtures insertion loss, shows the maximum and minimum IL but not the reference IL.

SuggestedRemedy

Please show the reference insertion loss of the mated test fixture also, on the same graph.

Response *Response Status* **C**

ACCEPT.

Cl **162B** *SC* **162B.1.3.1** *P* **256** *L* **25** # 177

Haser, Alex — Molex

Comment Type **TR** *Comment Status* **A** *MTF IL*

Start frequency has minimal impact on FOM_ILD values (see haser_3ck_adhoc_01c_062420, slide 8); a start frequency of 50 MHz is more practical than a start frequency of 10 MHz due to current commonly available VNA capabilities

SuggestedRemedy

Change fmin for FOM_ILD calculation from 10 MHz to 50 MHz

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change fmin for FOM_ILD calculation from 10 MHz to 50 MHz.

See slide 8 of the supporting presention
https://www.ieee802.org/3/ck/public/adhoc/jun24_20/haser_3ck_adhoc_01c_062420.pdf

Cl **162B** *SC* **162B.1.3.1** *P* **256** *L* **26** # 115

Kocsis, Sam — Amphenol

Comment Type **TR** *Comment Status* **D** *MTF RL*

MTF "FOM_ILD shall be less than (TBD) dB"

SuggestedRemedy

Change to "is recommended to be less than 0.18dB, and ILD(f) shall meet the values determined using the equation below."
ILD(f)<|1|dB for f<26.56GHz
ILD(f)<|3|dB for 26.56<f<40GHz,
see background/consensus presentation

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **162B** *SC* **162B.1.3.2** *P* **256** *L* **40** # 178

Haser, Alex — Molex

Comment Type **TR** *Comment Status* **A** *MTF RL*

Current RL mask doesn't accurately capture necessary RL performance

SuggestedRemedy

Remove RL mask and replace with ERL ; input values and ERL limit TBD

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The response to closed comment #122 adds an MTF ERL specification.

Change the differential return loss specification from normative to informative.

Strawpoll #14 (choose 1)
I support:
A: retain MTF return loss specification as normative
B: retain MTF return loss specification as informative
C: remove MTF return loss specification
A: 11 B: 18 C: 10

Cl **162B** *SC* **162B.1.3.2** *P* **256** *L* **41** # 122

Kocsis, Sam Amphenol

Comment Type **TR** *Comment Status* **A** *MTF RL*

text says test fixture "shall meet" Eq 162B-6

SuggestedRemedy

Change to "is recommended to meet and shall meet an ERL of 8dB, see background/consensus presentation

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The following presentation was reviewed by the task force:
https://www.ieee802.org/3/ck/public/20_10/kocsis_3ck_02a_1020.pdf
https://www.ieee802.org/3/ck/public/20_10/diminico_3ck_03_1020.pdf

Add subclause for MTF ERL with TBD dB requirement.

Add a table similar to Table 120G-4 with Tfx to "0" to use as reference for MTF ERL.

Implement with editorial license.

[Editor's note (to be removed when comment is closed): Response updated 2020/11/10.]

Straw poll #13 (decision), choose 1
I support closing comment #122 with:
A: ERL specification with minimum of 9 dB
B: ERL specification with minimum of TBD dB
C: No ERL specification
A: 21 B: 25 C: 1

Cl **162B** *SC* **162B.1.3.2** *P* **256** *L* **41** # 123

Kocsis, Sam Amphenol

Comment Type **TR** *Comment Status* **A** *MTF RL (bucket6)*

Add definition of ERL for MTF

SuggestedRemedy

Copy Table120G-4, change Tfx to "0", use as reference for MTF ERL

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The response to closed comment #122 adds a complete ERL specification.

Resolve using the response to comment #122.

Cl **162B** *SC* **162B.1.3.2** *P* **256** *L* **46** # 22

DiMinico, Christopher MC Communications

Comment Type **TR** *Comment Status* **R** *MTF RL*

Modify Equation (162B–6) DRL(f) > 40 GHz to align with achievable MTF return loss

SuggestedRemedy

See supporting presentation diminico_3ck_1020.pdf

Response *Response Status* **C**

REJECT.

The following presentation was reviewed by the task force:
https://www.ieee802.org/3/ck/public/20_10/diminico_3ck_03a_1020.pdf

The response to closed comment #178 changes the differential return loss specification from normative to informative.

The RL mask proposed on slide 12 of diminico_03a relaxes RL at frequencies greater than 40 GHz.

There is no consensus to make the proposed change.

Cl **162B** *SC* **162B.1.3.6** *P* **260** *L* **28** # 179

Haser, Alex Molex

Comment Type **ER** *Comment Status* **A** *MTF XTALK (bucket1)*

Section 110B.1.3.7 does not exist

SuggestedRemedy

Change reference to 110B.1.3.6

Response *Response Status* **C**

ACCEPT.

Cl **162B** *SC* **162B.1.3.6** *P* **260** *L* **28** # 116

Kocsis, Sam Amphenol

Comment Type **ER** *Comment Status* **A** *MTF XTALK (bucket1)*

Is the reference to "110B.1.3.7" valid? 802.3-2018

SuggestedRemedy

Change to "110B.1.3.6"

Response *Response Status* **C**

ACCEPT.

Cl **162B** *SC* **162B.1.3.6** *P* **260** *L* **29** # 180

Haser, Alex — Molex

Comment Type **TR** *Comment Status* **A** *MTF XTALK (bucket6)*

Start and stop frequencies are not defined for ICN calculation. This section points to (should point to) 110B.1.3.6, which specifies 50 MHz to 19 GHz; this range is insufficient for this data rate

SuggestedRemedy

Somehow specifiy ICN calculations should be done 50 MHz to 40 GHz with a 10 MHz step size, either by adding text or adding values to Table 162B-1

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Slide 24 of the following presentation provides updated wording to address this comment:
https://www.ieee802.org/3/ck/public/20_07/diminico_3ck_02e_0720.pdf

Implement with editorial license the proposal on slide 24 of diminico_3ck_02e_0720.

Cl **162B** *SC* **162B.1.3.6** *P* **260** *L* **32** # 117

Kocsis, Sam — Amphenol

Comment Type **TR** *Comment Status* **A** *MTF XTALK (bucket6)*

No definition of start and stop frequencies

SuggestedRemedy

Add defintion for fstart=50MHz, fstop=40GHz

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Resolve using response to comment #180.

Cl **162B** *SC* **162B.1.3.6** *P* **260** *L* **48** # 20

DiMinico, Christopher — MC Communications

Comment Type **TR** *Comment Status* **A** *MTF XTALK*

Replace TBD

SuggestedRemedy

Replace TBD with 1.6 mV

Response *Response Status* **C**

ACCEPT.

[Editor's note: Addresses incomplete specification.]

Cl **162B** *SC* **162B.1.3.6** *P* **260** *L* **52** # 118

Kocsis, Sam — Amphenol

Comment Type **ER** *Comment Status* **A** *MTF XTALK (bucket6)*

Assumed methodology reference is 92.11.3.6.3?

SuggestedRemedy

Add explicit reference, since specific parameters will be change for 3ck

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The response to comment #180 addresses the concern in this comment.

Resolve using the response to comment #180.

Cl **162B** *SC* **162B.1.3.6** *P* **260** *L* **54** # 181

Haser, Alex — Molex

Comment Type **TR** *Comment Status* **A** *MTF XTALK (bucket6)*

Start and stop frequencies are not defined for ICN calculations

SuggestedRemedy

Add "Integrated crosstalk RMS noise voltages are measured over N uniformly-spaced frequencies f_n spanning the frequency range 50 MHz to 40 GHz with a minimum spacing of 10 MHz." to the end of this section or add values to Table 162B1-3

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #180.

Cl **162B** *SC* **162B.1.3.6** *P* **261** *L* **1** # 119

Kocsis, Sam — Amphenol

Comment Type **TR** *Comment Status* **A** *MTF XTALK (bucket6)*

No definition of start and stop frequencies

SuggestedRemedy

Add defintion for fstart=50MHz, fstop=40GHz

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #180.

Cl **162C** SC **162C.1** P **264** L **52** # 270

Dawe, Piers Nvidia

Comment Type **E** *Comment Status* **A** *terminology (bucket1)*

I could not easily find what DL and SL mean

SuggestedRemedy

Add cross-reference to 162.8.1

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add reference 162.8.1 for signal names

Cl **162C** SC **162C.2.1** P **268** L **6** # 271

Dawe, Piers Nvidia

Comment Type **E** *Comment Status* **R** *MDI (bucket4)*

"SFP+ supports one lane", "QSFP+ supports up to four lanes" and so on

SuggestedRemedy

Would it be clearer to say "SFP+ supports one lane in each direction" and similarly for the other connector types?

Response *Response Status* **C**

REJECT.

Language usage is consistent with 802.3cd.
Make no changes.

Cl **162C** SC **162C.2.2** P **268** L **46** # 272

Dawe, Piers Nvidia

Comment Type **T** *Comment Status* **A** *MDI (bucket4)*

SFP-DD supports up to four lanes

SuggestedRemedy

SFP-DD supports up to four lanes [in each direction]
Similarly for DSFP.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change "SFP-DD supports up to four lanes" to "SFP-DD supports up to two lanes". Make the equivalent change for DSFP in 162C.2.3.

Cl **162C** SC **162C.3.3** P **275** L **22** # 273

Dawe, Piers Nvidia

Comment Type **E** *Comment Status* **A** *MDI (bucket1)*

Order of this table doesn't match the clause

SuggestedRemedy

Please re-order the entries in this table to align with the clause, renumbering the items.
Also, there is no MDI3 so some of them should be renumbered anyway.
Similarly for the table in 162C.3.4.1 Contact Mapping.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Re-order the entries in this table to align with the clause, renumbering the items.
Similarly for 162C.3.4.1.
Implement with editorial license.

Cl **162D** SC **162D.1** P **277** L **14** # 274

Dawe, Piers Nvidia

Comment Type **E** *Comment Status* **A** *MDI (bucket1)*

"Hosts have six specified MDI connectors “receptacles”": I read this as describing a 6-port host.

SuggestedRemedy

Suggest "There are six types of MDI connectors “receptacles” specified for hosts"

Response *Response Status* **C**

ACCEPT.

Cl **162D** SC **162D.1** P **277** L **32** # 275

Dawe, Piers Nvidia

Comment Type **T** *Comment Status* **A** *MDI (bucket1)*

This is the only time "host interface type" is used, and one would expect the phrase to mean PMD or PHY type on a host. We can wordsmith round this because six things were mentioned just above.

SuggestedRemedy

Change "This creates six host interface types and multiple cable..." to "Therefore, there are multiple cable..."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change "interface" to "receptacle"

Cl **163** *SC* **163.1** *P* **171** *L* **1** # 225

Dawe, Piers — Nvidia

Comment Type **E** *Comment Status* **R** *(bucket1)*

Layout

SuggestedRemedy

Remove blank lines at 1 and 25, make the first three tables wider so the notes take 2 lines not 3

Response *Response Status* **C**

REJECT.

The extra lines are a result of forcing the proper order and position of the tables. This can be fixed, but might result in other formatting issues when preceding text is changed in future drafts.

These tables are consistently the same width throughout 802.3ck and in other projects. Potential changes to the footnote in future drafts may change the length of the footnote. There is no need to change the width of the table to fix a hanging word at this time.

Minor issues relating to extra space and line lengths can be addressed toward the end of the project or during the publication editing when the document is more stable.

Cl **163** *SC* **163.9.2.1.3** *P* **178** *L* **26** # 228

Dawe, Piers — Nvidia

Comment Type **T** *Comment Status* **A** *example TF*

It doesn't make sense to have an RL spec for the test fixture only to 26.56 GHz, while the spec for the item under test extends to 40 GHz (see 162.9.3.5, referenced from Table 163-5: is that the right cross-reference?)

SuggestedRemedy

Provide a CM RL spec for the test fixture up to the same frequency as the product spec.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change reference in Table 163-5 from 162.9.3.5 to 163.9.2.1.3.

Change the text in 163.9.2.1.3 to "The common-mode to common-mode return loss shall be greater than or equal to 2 dB at all frequencies between 0.2 GHz and 40 GHz."

Cl **163** *SC* **163.9.2** *P* **176** *L* **30** # 135

Ghiasi, Ali — Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **R** *TP0v*

Transmit parameters must be measurable and well defined physical test point, the current TP0v test point methodology is not proven yet and is not uncommon when one inverts the channel spurious response to result. We have put into the draft unproven test method when the solution was trivial!

SuggestedRemedy

Just as we have done for the MCB and HCB losses, we need to increase the loss from the TP0 to TP0a a loss of 2.2 dB to 2.6 dB with nominal 2.4 dB loss is inline with MCB loss and allow construction of DUT boards with 2.5-3" long traces. Such traces combined with 2x8 or 2x12 2.5 mm pogo pins connectors allow breakout of high large 256 lanes switches. Make TP0a normative and make TP0v the method to de-embed when DUT PCB loss deviate from nominal range.

Response *Response Status* **C**

REJECT.

The new test fixture specifications were adopted based on sufficient support by the task force. See Comment #33 in the following:
https://www.ieee802.org/3/ck/comments/draft1p2/8023ck_D1p2_final_closedcomments.pdf

The comment does not provide sufficient evidence that the adopted approach will not work nor is the proposed remedy sufficiently complete to implement, e.g., limit values at TP0a, methodology.

Comment #73 proposes to remove TP0a as an example. Comment #136 proposes a new IL equation for the example test fixture.

This comment suggests to make TP0a normative same as previous draft and previous generations of PHYs and to use the TP0v method is to embed additional test fixture if its IL is out of range. TP0a is described an example in existing spec.

[Editor's note: CC: 120F, 163]

Based on straw poll #1 there is clear support to keep the TP0v test fixture methodology as normative.

Straw poll #1 is reproduced here for convenience:
I support keeping TP0v methodology as the normative specification (choose one)
Y: 27, N: 4, No Opinion: 11

Cl **163** *SC* **163.9.2** *P* **176** *L* **35** # 42

Healey, Adam — Broadcom Inc.

Comment Type **T** *Comment Status* **A** *clock tolerance*

The signaling rate range can be reduced to +/-50 ppm with minimal impact to the overall cost of the system. A lower signaling rate range can be leveraged by implementations to improve performance margin. However, interoperability with implementations that use 50 Gb/s/lane (and lower) AUIs must be preserved. The proposed changes encourage migration to higher-precision frequency references while maintaining compability with prior implementations with up +/-100 ppm tolerance.

SuggestedRemedy

This proposed change leverages terms from Clause 45 that describe how MDIO manageable devices are organized in the Physical Layer stack. The first is the idea that sublayers may be in the same "package" or in different packages (see IEEE Std 802.3-2018 45.1.1). The definition of a "package" is vendor specific (could be a chip, module, or other entity). The second is that a PMA that is not in the same package as the PMD is designated as a "separated PMA" (see IEEE Std 802.3-2018, 45.2.1). The third concept that is important to the proposed definition is that a PMA, by itself, has no control over the signaling rate tolerance. The frequency offset at the PMA output is inherited from the PMA input. Since the PMA has no control over this, It does not make sense to impose a specification on the PMA signaling rate range except for specific circumstances. Similar arguments can be made for PMD outputs as they inherit the frequency precision from the PMA.

In Table 162-9, Table 163-5, Table 120F-1, and Table 120G-1, change "signaling rate" (or "signaling rate per lane (range)") to 53.125 +/- 50 ppm and add a footnote to indicate 1) that the +/-50 ppm tolerance applies to PMA (and PMD) that are is the same package as the PCS and 2) that in other cases, the signaling rate is related to the signaling rate from the higher (separated PMA) sublayer.

In Table 120G-3, change "signaling rate per lane (range)" to "signaling rate per lane" with a value of 53.125. In 120G.3.1.1 (and/or a footnote to Table 120G-3), state the signaling rate tolerance at the module output is inherited from the PMD receiver input.

Also change 120G.3.1.1 to agree with changes Table 120G-1 and Table 120G-3.

No change to the input signaling rate range requirements in Table 162-12, Table 120G-4, and Table 120G-7 is needed because they continue to represent the largest extent of the signaling rate range for all allowed configurations of the Physical Layer stack.

Add a recommendation (to either Annex 120A or Annex 135A) that the signaling rate tolerance of the output of a "legacy" PCS/PMA (interface is not 100GAUI-1, 200GAUI-2, or 400GAUI-4) be constrained to +/-50 ppm when used with a separated PMA that has a 100GAUI-1, 200GAUI-2, or 400GAUI-4 interface.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: CC: 162, 163, 120F, 120G]

The following presentation was review by the task force:
https://www.ieee802.org/3/ck/public/20_10/healey_3ck_03_1020.pdf

Implement with editorial license the suggested remedy and proposal in the referenced presentation.

Straw poll #10 (decision)
I would support implementing the proposal in the suggested remedy of comment #42 and healey_3ck_03_1020.
Y: 30
N: 5

Cl **163** *SC* **163.9.2** *P* **176** *L* **43** # 153

Ghiasi, Ali — Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **R** *TX CM AC noise*

30 mV AC common mode results in 1+ dB of COM penalty, there is no technical bases for using such large amount of AC common mode

SuggestedRemedy

Reduce TX AC common mode from 30 mV to 15 mV RMS

Response *Response Status* **C**

REJECT.

Resolve using the response to comment #141.

Cl **163** *SC* **163.9.2** *P* **176** *L* **43** # 197

Wu, Mau-Lin MediaTek

Comment Type **T** *Comment Status* **R** *TX CM AC noise (bucket6)*

By adopting "TP0v" variable test fixture methodology, the value of "AC common-mode RMS voltage (max)" will be also strongly dependent on IL of TP0v. We need to fix this.

SuggestedRemedy

We shall define "Difference between measured and reference AC common-mode RMS voltage (max)" here. We shall define the AC common-mode RMS voltage (max) at TP0 and adopt one scaling factor which is related to IL of TP0v to derive the reference AC common-mode RMS voltage (max) at TP0v. Define the difference among measured one and reference one. Some information had been provided in wu_3ck_adhoc_01_090920.pdf. Plan to provide one contribution, wu_3ck_01_1120.pdf, for

Response *Response Status* **C**

REJECT.

The following presentation was reviewed by the task force:
https://www.ieee802.org/3/ck/public/20_10/wu_3ck_01_1020.pdf

The response to closed comment #205 against Annex 163A indicates that there is no consensus to adopt the AC CM noise specification based on the difference between measured and reference values similarly proposed in this comment.

There is no consensus to make the proposed changes.

[Editor's note: CC: 120F, 163]

Cl **163** *SC* **163.9.2** *P* **176** *L* **44** # 61

Ran, Adee Intel

Comment Type **T** *Comment Status* **A** *vf/vpeak/erl*

Table 163-5 has multiple TBDs.

Reference ERL, v_f and v_peak are calculated with an idealized package model. Real products deviate from this model, so the limit values may need adjustment.

v_f and v_peak may be degraded by a device or pacakge, but that can be mitigated using higher than minimum launch voltage and some equalization. So for dv_f and dv_peak, a minimum of 0 V may be acceptable.

There is no straightforward method to improve ERL. So to allow a wide range of implementations, the minimum dERL should be less than 0 dB. A minimum of -3 dB may be acceptable.

SuggestedRemedy

Change value for dv_f in Table 163–5 from TBD to 0.

Change value for dv_peak in Table 163–5 from TBD to 0.

Change value for dERL in Table 163–5 from TBD to -3.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

The following presentation was reviewed by the task force:
https://www.ieee802.org/3/ck/public/20_10/wu_3ck_02_1020.pdf

The response to comment #13 replaces the specification of dv_peak to dR_peak.

Implement suggested remedy with editorial license, except change the name of dv_peak to dR_peak and use the value 0 with no units.

[Editor's note: CC: 163, 120F]

Cl **163** *SC* **163.9.2** *P* **176** *L* **44** # 60

Ran, Adee Intel

Comment Type **E** *Comment Status* **A** *ERL reference (bucket1)*

Reference to dERL in the table should be the subclause that specifies parameters and points to the annex.

SuggestedRemedy

Change reference for dERL in Table 163–5 from 163A.3.2.2 to 163.9.2.3.

Response *Response Status* **C**

ACCEPT.

Cl **163** *SC* **163.9.2** *P* **176** *L* **44** # 29

Healey, Adam Broadcom Inc.

Comment Type **T** *Comment Status* **A** *TP0v method*

The reference to 163A.3.2.2 is in danger of becoming circular. Annex 163A is mostly written to be generic and states that PHY/interface-specific parameters are "specified by the clause that invokes this method". However, no such specifications can be found in this clause, or in Annex 120F, that provides this information. This includes "test channel requirements", electrical characteristics used to compute S^(tp), values for Tr, fr, At, Tb, etc. One could assume that "test channel" requirements are given in the transmitter test fixture definition in 163.9.2.1, and the other values are the same as those used to compute COM from 163.10.1, but this should not be left to assumptions. It is unclear whether test 1 or test 2 (or test 1 AND test 2) characteristics for S^(tp) should be used and clarity on this point needs to be provided.

SuggestedRemedy

Add a new subclause to Clause 163 and change the reference for "dERL", "dvf", and "dvpeak" to this new subclause. The content of this subclause should be specifications for the PMD/interface-specific parameters that Annex 163A says are to be defined by the "clause that invokes this method". Similar changes would be necessary for Annex 120F.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #62.

[Editor's note: CC: 163, 120F]

Cl **163** *SC* **163.9.2** *P* **176** *L* **44** # 202

Wu, Mau-Lin MediaTek

Comment Type **T** *Comment Status* **A** *ERL value (bucket5)*

dERL is still TBD

SuggestedRemedy

Suggest to set as some negative values. I had shared some information in wu_3ck_adhoc_01_092320.pdf. I plan to prepare one contribution, wu_3ck_02_1120.pdf, for this comment.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The referenced ad hoc presentation is here:
https://www.ieee802.org/3/ck/public/adhoc/sept23_20/wu_3ck_adhoc_01a_092320.pdf

The following presentation was reviewed by the task force:
https://www.ieee802.org/3/ck/public/20_10/wu_3ck_02_1020.pdf

Resolve using the value in the response to comment #61.

Cl **163** *SC* **163.9.2** *P* **176** *L* **48** # 62

Ran, Adee Intel

Comment Type **T** *Comment Status* **A** *TP0v method*

dv_f and dv_peak refer directly to 163A.3.2.1, but some parameters are missing for the calculations:

A_t - should be taken from table 163-11 (or specify as the value 0.4 V)
z_p - should be the maximum value from table 163-11

SuggestedRemedy

Add a subclause under 162.9.2 (similar to 163.9.2.3 for dERL) to define the calculation of dv_f and dv_peak; in that subclause, point to 163A.3.2.1 and supply the required parameters as in the comment.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The response to comment #13 replaces dv_peak with dR_peak.

Implement suggested remedy under 163.9.2 with editorial license addressing dR_peak instead of dv_peak.

[Editor's note: CC: 163, 120F]

Cl **163** *SC* **163.9.2** *P* **176** *L* **50** # 5

Mellitz, Richard Samtec

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

We need to specify V_peak/V_f not V_peak. I.e. pulse peak loss

SuggestedRemedy

Change
Difference between measured and reference linear fit pulse peak
To
Difference between measured and reference linear fit pulse peak loss (min) d(V_peak/V_f)

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using respongse to comment #13.

[Editor's note: CC: 163, 120F]

Cl **163** *SC* **163.9.2** *P* **177** *L* **5** # 63

Ran, Adee Intel

Comment Type **E** *Comment Status* **A** *TX FIR (bucket1)*

abs step size " for c(–3), c(–2), c(–1), c(0), and c(1)"

This list includes all possible values, so it is redundant. Clause 162 has "for all taps" instead.

SuggestedRemedy

Change the quoted words to "for all taps", both for min and for ax.

Response *Response Status* **C**

ACCEPT.

Cl **163** *SC* **163.9.2** *P* **177** *L* **12** # 226

Dawe, Piers Nvidia

Comment Type **E** *Comment Status* **A** *SNDR*

It's surprising that the only definition of SNDR is table footnote c. The reader could miss the deviation from 120D.3.1.6.

SuggestedRemedy

At least put 162.9.3.1.1 in the Reference column with 120D.3.1.6

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add new subclause in 162.9.3 Transmitter Characteristics to specify SNDR based on 120D.3.1.6 and 162.9.3.1.1 and change reference in table to the new subclause.

Use this same subclause for TX SNDR specification in 162, 163, and 120F.

Implement with editorial license.

Cl **163** *SC* **163.9.2** *P* **177** *L* **16** # 187

Calvin, John Keysight Technologies

Comment Type **T** *Comment Status* **A** *EO jitter (bucket5)*

The spec limit for Even-Odd jitter is only 358 femtoseconds, which is too low to be accurately measured with current state of the art test equipment.

SuggestedRemedy

Increase the spec limit from 0.019 UI to 0.025 UI

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolved using the response to comment #190.

Cl **163** *SC* **163.9.2.1.1** *P* **177** *L* **47** # 227

Dawe, Piers Nvidia

Comment Type **T** *Comment Status* **A** *test fixture*

Try to exclude unexplored / unnecessary areas of inaccuracy or poor reproducibility in measurement.

SuggestedRemedy

Set a minimum insertion loss for this test fixture as well as a maximum. It could be as low as 1.2 dB which we had before for TP0a, or it could be higher.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add minimum IL 1.7 dB.

Cl **163** *SC* **163.9.2.1.1** *P* **177** *L* **48** # 64

Ran, Adee Intel

Comment Type **T** *Comment Status* **A** *test fixture*

ILD definition in 93A.4 should be cross referenced.

This definition requires some parameters. Specifically the transition time Tt, which should correspond to the observable transition time at TP0 (larger than the internal value).

SuggestedRemedy

Append "Insertion loss deviation is calculated as specified in 93A.4, where T_t is 0.1 ns, and f_b and f_t values are taken from Table 163-11."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement suggested remedy except with T_t set to 0.01 ns.

Cl **163** *SC* **163.9.2.1.2** *P* **178** *L* **5** # 161

Dudek, Mike Marvell.

Comment Type **T** *Comment Status* **A** *test fixture*

There is no specification for the ERL of the test fixture

SuggestedRemedy

Insert a Paragraph "The ERL of the test fixture shall be greater than TBD dB"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]
Resolve using the response to comment #65.

Cl **163** *SC* **163.9.2.1.2** *P* **178** *L* **21** # 65

Ran, Adee Intel

Comment Type **T** *Comment Status* **A** *test fixture*

Per resolution of comment 154 against D1.2 there should be a requirement on test fixture ERL:

"The ERL at TP0v shall be greater than or equal to TBD".

This part has not been implemented.

With N=20 the ERL of the test fixture is expected to be very good. The TBD may be changed to 15 dB (same as in clause 137) if there is consensus.

SuggestedRemedy

Add the following sentence after the table"

"The ERL at TP0v shall be greater than or equal to TBD dB".

Consider changing TBD to 15 dB.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Insert the following sentence after the table:
"The ERL at TP0v shall be greater than or equal to 15 dB".

Cl **163** *SC* **163.9.2.2** *P* **178** *L* **28** # 73

Brown, Matt Huawei

Comment Type **T** *Comment Status* **A** *example TF*

The example test fixture using TP0a is no longer required. See the following ad hoc presentation;
https://www.ieee802.org/3/ck/public/adhoc/sept16_20/brown_3ck_adhoc_01a_091620.pdf

SuggestedRemedy

Remove 163.9.2.2 and reference TP0v instead of TP0a for all transmitter specifications for KR (Clause 163) and C2C (Annex 120F).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Keep the informative test fixture, but move it to new informative Annex 163B.

[Editor's note: CC: 120F, 163]

Cl **163** *SC* **163.9.2.2** *P* **178** *L* **29** # 6

Mellitz, Richard Samtec

Comment Type **TR** *Comment Status* **A** *example TF*

TP0a is moot and replaced by TP0v

SuggestedRemedy

remove references to TP0a.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #73.

Cl **163** *SC* **163.9.2.2** *P* **178** *L* **33** # 229

Dawe, Piers Nvidia

Comment Type **T** *Comment Status* **A** *example TF*

An example with a range is more complicated than it need be.

SuggestedRemedy

Pick a single example IL, e.g. 3.5 or 4 dB. Make this and the IL equation 163-3 consistent. Give the reference ERL, steady-state voltage and so on for the example.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Set the informative test fixture insertion loss at Nyquist to 2.8 dB.

Set the IL curve to the one on slide 5 of the following presentation:
https://www.ieee802.org/3/ck/public/20_10/ghiasi_3ck_01a_1020.pdf

Implement with editorial license.

Cl **163** *SC* **163.9.2.2** *P* **178** *L* **33** # 204

Wu, Mau-Lin MediaTek

Comment Type **T** *Comment Status* **A** *example TF (bucket4)*

The IL and ILD specs here are too challenging to achieve. In this case, I see no points to provide this kind of "example TX test fixture". Based on that, I proposed to relax the IL and ILD specs of this example TX test fixture (TP0a). Detailed information had been included in wu_3ck_adhoc_01_092320.pdf. I plan to prepare one contribution, wu_3ck_02_1120.pdf, for this comment.

SuggestedRemedy

Change IL and ILD specs of the example TX test fixture (TP0a) to "between 2.0 dB and 2.8 dB at 26.56 GHz". ILD is less than or equal to 0.2 dB from 0.05 to 26.56 GHz
Remove the Equation (163-1), Figure 163-4, and related paragraphs since TP0a is just an example and informative

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #229.

Cl **163** *SC* **163.9.2.2** *P* **178** *L* **33** # 162

Dudek, Mike Marvell.

Comment Type **TR** *Comment Status* **A** *example TF (bucket4)*

The insertion loss of this example test fixture is un-realistically low. This applies to the Rx test fixture as well.

SuggestedRemedy

Change the loss to "between 2.4 and 3.2dB" and double the co-efficients in equation 163-1 and change Figure 163-4 to match. Note that the Rx test fixture refers to this equation and figure as well. Change the loss of the Rx test fixture to "between 2.4 and 3.2dB" on page 181 line 19.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #229.

Cl **163** *SC* **163.9.2.2** *P* **178** *L* **39** # 26

Ben-Artsi, Liav — Marvell Semiconductor ltd.

Comment Type **T** *Comment Status* **A** *example TF (bucket4)*

The transmitter and reciever test fixture informative examples are irrelevant, since they have extremely low loss

SuggestedRemedy

Recommend changing equation 163.1 to IL(F) = 0.01+0.292*sqrt(F)+0.0936*F (F in GHz), which is more realistic and meets 4dB of loss at 26.5625GHz. It is also refered to in 163.9.3.2 on page 181 lines 22-24

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to #229.

Cl **163** *SC* **163.9.2.2.** *P* **178** *L* **33** # 136

Ghiasi, Ali — Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **A** *example TF (bucket4)*

Inccrease the loss from 1.2 dB and 1.6 dB

SuggestedRemedy

to 2.2 and 2.6 dB and update equation 163-1 to
=0.0062 + 0.1753*sqrt(f)+0.0561*f the equation nominal loss is 2.4 dB

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #229.

Cl **163** *SC* **163.9.2.3** *P* **179** *L* **39** # 31

Healey, Adam — Broadcom Inc.

Comment Type **T** *Comment Status* **D** *ERL tfx*

It seems that "T_fx" should be 0 for TP0v-based ERL method given the test fixture is to be embedded and not de-embedded (and not time-domain gated).

SuggestedRemedy

Replace the following sentence "The value of Tfx is twice the delay from TP0 to TP0v." with "The value of T_fx is 0." A similar change would also be appropriate for 120F.3.1.1.

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **163** *SC* **163.9.2.3** *P* **179** *L* **43** # 66

Ran, Adee — Intel

Comment Type **E** *Comment Status* **A** *ERL wording (bucket1)*

"The reference for obtaining the reference"

SuggestedRemedy

Change to "The method for obtaining the reference"

Response *Response Status* **C**

ACCEPT.

Cl **163** *SC* **163.9.2.3** *P* **179** *L* **44** # 32

Healey, Adam — Broadcom Inc.

Comment Type **E** *Comment Status* **A** *ERL wording (bucket1)*

"The reference for obtaining the reference ERL is defined in 163A.3.1." is an awkward sentence.

SuggestedRemedy

120F.3.1.1 has somewhat different wording and 163.9.2.3 could be changed to match. At a minimum, change the sentence to: "The reference transmitter ERL is defined in 163A.3.1."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #66.

Cl **163** *SC* **163.9.2.3** *P* **179** *L* **44** # 74

Brown, Matt — Huawei

Comment Type **E** *Comment Status* **A** *ERL wording (bucket1)*

Wording

SuggestedRemedy

Change "The reference for obtaining" to "The method for obtaining".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #66.

Cl **163** *SC* **163.9.3** *P* **180** *L* **17** # 7

Mellitz, Richard Samtec

Comment Type **TR** *Comment Status* **A** *TP5v (bucket2)*

TP5a is moot and replaced by TP5v

SuggestedRemedy

remove references to TP5a and replace with TP5v.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #40.

Cl **163** *SC* **163.9.3** *P* **180** *L* **25** # 154

Ghiasi, Ali Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **R** *RX CM AC noise*

Receiver specifications at TP5a must include max AC common mode

SuggestedRemedy

Add max AC commonm mode 17.5 mV to the table

Response *Response Status* **C**

REJECT.

Resolve using the response to comment #142.

Cl **163** *SC* **163.9.3** *P* **180** *L* **26** # 8

Mellitz, Richard Samtec

Comment Type **TR** *Comment Status* **A** *ERL value (bucket6)*

There is no reason why the receive ERL specification should be different from the transmitter ones.

SuggestedRemedy

Point to the transmitter specification for DERL

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #67.

Cl **163** *SC* **163.9.3.1** *P* **180** *L* **33** # 67

Ran, Adee Intel

Comment Type **T** *Comment Status* **A** *ERL value*

The method of Annex 163A can be used for receiver ERL just like it is for transmitter ERL, that is, specify difference from a reference value.

In the case of the receiver, there may be a tradeoff between optimizing for ERL and optimizing for BER. The receiver should be allowed more design freedom. Therefore the minimum dERL should be lower than for the receiver.

A minimum dERL of -5 dB may be acceptable. Alternatively, dERL can be made informative (recommendation).

Also applies to 120F.3.2.1.

SuggestedRemedy

Change receiver ERL sublcause (163.9.3.1) to match 163.9.2.3.

In Table 163-9, change ERL (min) to dERL(Min) with value -5 dB.

Change subclause 120F.3.2.1 to match 163.9.3.1 (apply the change above).

In Table 120F-4, change ERL (min) to dERL(Min) with value -5 dB.

Consider changing Rx dERL from a normative specification (shall) to a recommendation (should).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Closed comment #40 aligned the RX test fixture with the TX test fixture and the replaced ERL with dERL.

Use the value provided in the response to comment #61 (-3 dB).

There was no consensus to make a change to the normative nature of RX dERL.

[Editor's note: CC: 163, 120F]

Cl **163** *SC* **163.9.3.1** *P* **180** *L* **34** # 40

Healey, Adam — Broadcom Inc.

Comment Type **T** *Comment Status* **A** *RX test fixture*

Now that the transmitter has relaxed test fixture requirements and taken a "test fixture embedding" approach, it seems appropriate for the receiver to follow suit.

SuggestedRemedy

Update 163.9.3.2 by changing references to "TP5a" to "TP5v" and add a pointer to 163.9.2.1 for test fixture requirements. Replace the specification of "ERL (min)" in Table 163-9 with a specification of "dERL" as is done for the transmitter and update 163.9.3.1 accordingly. Implement similar changes in Annex 120F. Update Annex 163A to include calculation of the reference ERL at TP5v (which should largely be a "mirror image" of the material currently describing the calculation of the reference ERL at TP0v). For interference tolerance and jitter tolerance test channel calibration, exceptions to 93A.2 and Annex 93C would need to be made to substitute TP0 to TP0v (and TP5v to TP5) replicas for their TP0 to TP0a (And TP5a to TP5) counterparts.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Based on Strawpoll #5 there is clear consensus to align the RX test fixture with the TX test fixture. Straw poll #5 is reproduced here for convenience.

Straw Poll #5:
I support aligning RX to TP0v test fixture characteristics and methodology:
Y: 22, N: 1, No Opinion: 6

Align the RX test fixture specifications with the TX TF specifications based on slide 12 of: https://www.ieee802.org/3/ck/public/adhoc/sept16_20/brown_3ck_adhoc_01a_091620.pdf

For 163.9.3.2:
Change references to "TP5a" to "TP5v" and add a pointer to 163.9.2.1 for test fixture requirements.
Replace the specification of "ERL (min)" in Table 163-9 with a specification of "dERL" as is done for the transmitter and update 163.9.3.1 accordingly.

For 163.9.3.3 RITT, add a bullet at the beginning of the considerations, "In this subclause TP0v (TP5v) replaces TP0a (TP5a) in Annex 93A and Annex 93C'.

For 163.9.3.4 JTOL, add a sentence after "The test setup shown in Figure 93–12, or its equivalent, is used.": "In this subclause TP0v (TP5v) replaces TP0a (TP5a) in Annex 93A, Annex 93C, and Annex 120D"

Implement similar changes in Annex 120F.

For Annex 163A:
Change to include calculation of the reference ERL at TP5v (which should largely be a "mirror image" of the material currently describing the calculation of the reference ERL at TP0v).

Implement with editorial license.

[Editor's note: CC: 163, 120F,163A]

Cl **163** *SC* **163.9.3.1** *P* **180** *L* **34** # 164

Dudek, Mike — Marvell.

Comment Type **E** *Comment Status* **A** *(bucket1)*

It is strange to have the ERL section that needs the Rx Test fixture ahead of the description of the test fixture.

SuggestedRemedy

Reverse the order of the Rx ERL and Receiver test fixture sections to match the Tx order.

Response *Response Status* **C**

ACCEPT.

Cl **163** *SC* **163.9.3.1** *P* **180** *L* **37** # 163

Dudek, Mike — Marvell.

Comment Type **TR** *Comment Status* **A** *ERL value (bucket3)*

The use of the trace replica in 93A.2 already enables the use of a variable loss Rx test fixture for the interference tolerance test fixture. It would be better to enable this for the ERL test as well as has been done for the Transmitter.

SuggestedRemedy

Change the specification in Table 163-9 and section 163.9.3.1 from ERL to dERL using the methodology of Annex 163A with suitable exceptions

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #40.

Cl **163** *SC* **163.9.3.2** *P* **181** *L* **1** # 9

Mellitz, Richard — Samtec

Comment Type **TR** *Comment Status* **A** *RX test fixture (bucket2)*

There is no reason why the receive test fixture specification should be different from the transmitter one.

SuggestedRemedy

Point to the transmitter specification for test fixture

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #40.

Cl **163** *SC* **163.9.3.2** *P* **181** *L* **1** # 81

Brown, Matt Huawei

Comment Type **T** *Comment Status* **A** *RX test fixture (bucket2)*

In Draft 1.3, the transmitter test fixture specification (TP0 to TP0a) was replace with a new test fixture specification (TP0 to TP0v). The receiver test fixture should be rewritten to match the new transmitter test fixture specfication.

SuggestedRemedy

Align the receiver test fixture specification with the new transmitter test fixtures specification based upon slide 12 of the following presentation:
https://www.ieee802.org/3/ck/public/adhoc/sept16_20/brown_3ck_adhoc_01a_091620.pdf
In 163 and 120F, replace all references to TP5a with TP5v.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #40.

Cl **163** *SC* **163.9.3.2** *P* **181** *L* **1** # 75

Brown, Matt Huawei

Comment Type **E** *Comment Status* **A** *(bucket1)*

The test fixture should be defined before defining test specifications and methods. As was done for the TX test fixture subclause, move the RX TF subclause to before the ERL subclause.

SuggestedRemedy

Move 163.9.3.2 ahead of 163.9.3.1.

Response *Response Status* **C**

ACCEPT.

Cl **163** *SC* **163.9.3.2** *P* **181** *L* **3** # 23

Ben-Artsi, Liav Marvell Semiconductor ltd.

Comment Type **E** *Comment Status* **A** *TP5v (bucket2)*

According to direction of the entire path, TP5a is the input to the test fixture and not the output

SuggestedRemedy

Change: "Unless otherwise noted, measurements of the receiver are made at the output of a test fixture (TP5a) as
shown in Figure 163–5." to: "Unless otherwise noted, measurements of the receiver are made at the input of a test fixture (TP5a) as
shown in Figure 163–5."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Closed comment #40 results in TP5a being updated to TP5v.

Implement the suggested remedy, except replace "TP5a" with "TP5v".

Cl **163** *SC* **163.9.3.2** *P* **181** *L* **3** # 69

Ran, Adee Intel

Comment Type **E** *Comment Status* **A** *(bucket1)*

The receiver test fixture characteristics should be defined before the measurements performed with it, as in the transmitter. Currently Receiver ERL appears first.

SuggestedRemedy

Move subclause 163.9.3.2 before 163.9.3.1.

Response *Response Status* **C**

ACCEPT.

Cl **163** *SC* **163.9.3.2** *P* **181** *L* **3** # 68

Ran, Adee Intel

Comment Type **T** *Comment Status* **A** *RX test fixture (bucket2)*

Receiver test fixture defined here is not realistic (IL of 1.2-1.6 dB at 25.56 GHz). The test fixture specification should be similar to the transmitter's test fixture.

SuggestedRemedy

Chage the receiver test fixture subclause (163.9.3.2) to match 163.9.2.1 or point to it.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #40.

Cl **163** *SC* **163.9.3.2** *P* **181** *L* **18** # 137

Ghiasi, Ali — Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **A** *RX test fixture (bucket4)*

Inccrease the loss from 1.2 dB and 1.6 dB

SuggestedRemedy

to 2.2 and 2.6 dB

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the responses to comments #40 and #229.

Cl **163** *SC* **163.9.3.2** *P* **181** *L* **19** # 230

Dawe, Piers — Nvidia

Comment Type **T** *Comment Status* **A** *RX test fixture (bucket2)*

We agreed that a test fixture test fixture between 1.2 dB and 1.6 dB is not practical.

SuggestedRemedy

Make the receiver test fixture like the transmitter test fixture.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #40.

Cl **163** *SC* **163.9.3.2** *P* **181** *L* **19** # 24

Ben-Artsi, Liav — Marvell Semiconductor ltd.

Comment Type **T** *Comment Status* **A** *RX test fixture (bucket2)*

The test fixture inserrtion loss of 1.2-1.6dB is not commonly feasible

SuggestedRemedy

Recommend adjusting TP5a-TP5 fixture characteristics to be the same as those defined for TP0-TP0a.
Can either define less than 5dB of loss and ILD less than 0.2dB, or even in a simpler manner , just refer to 163.9.2.1.1 (insertion loss), 163.9.2.1.2 (ERL) and 163.9.2.1.3 (common mode RL)

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #40.

Cl **163** *SC* **163.9.3.2** *P* **181** *L* **26** # 193

Wu, Mau-Lin — MediaTek

Comment Type **T** *Comment Status* **A** *RX test fixture (bucket2)*

The sentence here is to define the "differential return loss" of the test fixture (TP5a) and refer to Equation (163-2) & Figure 163-6. However, the refered equation and figure are not correct.
The reason is that the original equation (Equation 163-2) & figure (Figure 163-4) in D1p2 had been removed from D1p3

SuggestedRemedy

Copy Equation 163-2 & Figure 163-4 in D1p2 & related description to D1p3. Put them in the appropriate location & correct the refered Equation ID & Figure ID.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #40.

Cl **163** *SC* **163.9.3.2** *P* **181** *L* **26** # 25

Ben-Artsi, Liav — Marvell Semiconductor ltd.

Comment Type **T** *Comment Status* **A** *RX test fixture (bucket2)*

The differential return loss of the test fixture is defined to meet Equation (163–2) and 163-3 which are an incorrect reference

SuggestedRemedy

Recommend replacing with a reference to 163.9.2.1.2 (Tx test fixture ERL)

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #40.

Cl **163** *SC* **163.9.3.2** *P* **181** *L* **26** # 165

Dudek, Mike — Marvell.

Comment Type **TR** *Comment Status* **A** *RX test fixture (bucket2)*

Equation 163-2 and figure 163-6 are nothing to do with return loss. Also it would be better to use ERLas the parameter.

SuggestedRemedy

Change to match the Tx test fixture Replace the sentence referring to return loss with "The Receiver test fixture shall meet the specification for ERL in 163.9.2.1.2"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #40.

Cl **163** *SC* **163.9.3.3** *P* **181** *L* **34** # 70

Ran, Adee Intel

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

The exception that "transmitter equalization is configured by management..." is taekn from the AUI-C2C (Annex 120D) which does not have a training protocol.

This clause is for the KR PMD that does have a training protocol defined, so this exception is out of place. The procedure in Annex 93C should be used as is.

SuggestedRemedy

Delete the sendence "with the exception that transmitter equalization is configured by management (see 120D.3.2.3) to the settings that provide the lowest FEC symbol error ratio".

Response *Response Status* **C**

ACCEPT.

Cl **163** *SC* **163.9.3.3** *P* **181** *L* **35** # 231

Dawe, Piers Nvidia

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

This isn't right: "transmitter equalization is configured by management (see 120D.3.2.3) to the settings that provide the lowest FEC symbol error ratio". It's the receiver's responsibility to choose an adequate transmitter equalization setting. Further, the transmitter could be a test instrument that doesn't do 802.3 management. What has 120D.3.2.3 got to do with it? Was this text copied from a C2C clause?

SuggestedRemedy

Correct the text. The transmitter equalization is what the receiver asks for after it's had a chance to train, or a default if it doesn't ask for anything in particular.
Same for 163.9.3.4 Receiver jitter tolerance.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve the issue with 163.9.3.3 using the response to comment #70.

For the issue with 163.9.3.4, implement the changes highlighted in slide 5 of https://www.ieee802.org/3/ck/public/20_10/ran_3ck_03_1020.pdf.

Except also remove item d).

Implement with editorial license.

Cl **163** *SC* **163.9.3.3** *P* **181** *L* **42** # 194

Wu, Mau-Lin MediaTek

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

The reference equation, Equation (163-2), is not correct. It shall be the original equation (equation 163-2) in D1p2 and be removed from D1p3.

SuggestedRemedy

Copy Equation 163-2 in D1p2 & related description to D1p3. Put them in the appropriate location & correct the referred Equation ID.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #71.

Cl **163** *SC* **163.9.3.3** *P* **181** *L* **42** # 166

Dudek, Mike Marvell.

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

Equation 163-2 is nothing to do with return loss. Also it would be better to use ERLas the parameter.

SuggestedRemedy

Change to "The ERL of the test setup in Figure 93C–4 measured at TP5 replica towards TPt meets the
requirements for ERL in 163.9.2.1.2 with the exception that the length of the reflection signal N is 3500 UI"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #71

Cl **163** *SC* **163.9.3.3** *P* **181** *L* **42** # 71

Ran, Adee Intel

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

In item b, Equation 163-2 is a calculation of A_DD, not related to return loss.

The transmitter's test fixture only has an ERL spec, and that is defined from TP0v towards the DUT. It is not an appropriate ERL for TP5 replica (e.g. has only N=20 UI).

The breakout from the package is typically controlled by the PMD's vendor and is practically part of the DUT. Therefore we should not add ERL specifications for the TP5 replica - they may be irrelevant and even incorrect for a specific implementation.

This is similar to the case of a transmitter's test fixture where ERL is specified toward the DUT, but not from the DUT toward TP0v.

Instead, the test channel's ERL should be specified to meet the ERL specifications in 163.10.3.

Also applies in 120F.3.2.3 item b which has "The return loss of the test setup in Figure 93C–4 measured at TP5 replica towards TPt meets the return loss specifications in 163.9.2.1" - but there are no return loss specifications in 163.9.2.1 anymore.

SuggestedRemedy

Replace item b with the following:

The return loss of the test channel measured at TP5a towards TPt meets the requirements in 163.10.3.

Apply similar change in 120F.3.2.3 with the reference to requirements in 120F.4.3 instead.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace item b with "The effective return loss of the test channel measured at TP5 replica towards TPt meets the requirements in 163.10.3."

Apply similar change in 120F.3.2.3 with the reference to requirements in 120F.4.3 instead.

Implement with editorial license.

[Editor's note: CC: 163, 120F]

Cl **163** *SC* **163.9.3.3** *P* **181** *L* **50** # 168

Dudek, Mike Marvell.

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

The relationship between Tr of the transmitter and the Trm measurement will be a function of the loss between TP0 and TP0v and the Nyquist frequency. The equation used was only valide for the loss of the test fixture of 1.4dB with a Nyquist frequency of approx 12.5GHz.

SuggestedRemedy

Replace the equation with TBD.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add an editor's note stating that this equation should be revisited.

Cl **163** *SC* **163.9.3.3** *P* **181** *L* **51** # 167

Dudek, Mike Marvell.

Comment Type **TR** *Comment Status* **A** *TP0v (bucket3)*

TP0v is not used in Annex 93C which describes this test method.

SuggestedRemedy

Either add a bullet at the beginning of the considerations. "In this clause TP0v replaces TP0a in annex 93C". Or Replace "TP0v" with "TP0a". Do the same in section 163.9.3.4

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #40.

Cl **163** *SC* **163.9.3.3** *P* **182** *L* **3** # 279

Li, Mike Intel

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

Np TBD

SuggestedRemedy

Np = 29, see li_3ck_01_0920

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

The following presentation was reviewed by the task force:
https://www.ieee802.org/3/ck/public/20_10/li_3ck_01_1020.pdf

Implement the suggested remedy.

Cl **163** *SC* **163.9.3.3** *P* **182** *L* **5** # 72

Ran, Adee Intel

Comment Type **E** *Comment Status* **A** *RITT (bucket1)*

In item e), the phrase "where Q3 is 3.2905" should be moved below the equations, with and explanation of what Q3 stands for (as in 136.9.4.2.3).

Alternatively, the equations can be replaced by cross reference to equations 136-8 and 136-9.

SuggestedRemedy

per comment.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

move "where Q3 is 3.2905" below the equations.
Copy notes from 136.9.4.2.3 to explain what Q3 stands for.

Cl **163** *SC* **163.9.3.3** *P* **182** *L* **20** # 155

Ghiasi, Ali Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **R** *RX CM AC noise*

Inteference tolerance must include AC common mode

SuggestedRemedy

Add step k to the list: Adjust stressor P/N skew if necessary to achive 17.5 mV AC RMS.

Response *Response Status* **C**

REJECT.

Resolve using the response to comment #142.

Cl **163** *SC* **163.9.3.4** *P* **183** *L* **41** # 200

Wu, Mau-Lin MediaTek

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

The "Case E from Table 162-15" here is not correct. The original one in D1p2 is "Case E from Table Table 163-9", where Case E is the case with Jitter frequency 40 MHz. However, the "Case E from Table 162-15" in D1p3 is the case with Jitter frequency 12 MHz.
There is one similar errors in step c) in 120F.3.2.4 at page 214.

SuggestedRemedy

Change "Case E from Table 162-15" to "Case F from Table 162.15" both in step c) in 163.9.3.4 at page 183 & step c) in 120F.3.2.4 at page 214.

Response *Response Status* **C**

ACCEPT.

[Editor's note: CC: 120F, 163]

Cl **163** *SC* **163.10.2** *P* **186** *L* **28** # 232

Dawe, Piers Nvidia

Comment Type **T** *Comment Status* **A** *channel IL*

A -60 dB response at 45 GHz, 32 dB below the response at Nyquist, can't matter, but a respectable channel could fail this limit.

SuggestedRemedy

Replace the straight part of the limit with one that curves down.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Equation for IL mask is not provided.
The suggested remedy does not provide sufficient details to implement.

Resolve using the response to comment #255.

Cl **163** *SC* **163.10.3** *P* **186** *L* **41** # 10

Mellitz, Richard Samtec

Comment Type **TR** *Comment Status* **A** *ERL value (bucket5)*

The ERL range is between 9.7 dB and 23.5 dB for published channel that representative of 100G KR designs.

SuggestedRemedy

change the TBD in in line 41 to 9.7 dB

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Addresses incomplete specification.]

Resolve using the response to comment #114.

Cl **163** *SC* **163.10.5** *P* **186** *L* **48** # 138

Ghiasi, Ali Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **R** *AC coupling*

802.3cd standards specified 50 kHz AC coupling but this standard is operating 2x the Baudrate

SuggestedRemedy

Replace 50 KHz with 100 kHz

Response *Response Status* **C**

REJECT.

Resolve using the response to comment #129.

Cl **163** *SC* **163.13.4.3** *P* **192** *L* **8** # 12

Mellitz, Richard Samtec

Comment Type **TR** *Comment Status* **D** *ERL wording*

We are not specifying ERL directly

SuggestedRemedy

Change TC2 to DERL at TP0v

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **163** *SC* **163.13.4.4** *P* **192** *L* **33** # 11

Mellitz, Richard Samtec

Comment Type **TR** *Comment Status* **A** *TP5v (bucket2)*

TP5a is moot and replaced by TP5v

SuggestedRemedy

remove references to TP5a and replace with TP5v. Change RC2 to DERL at TP5v

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #40.

Cl **163** *SC* **163.A.3.1** *P* **281** *L* **25** # 139

Ghiasi, Ali Ghiasi Quantum/Inphi

Comment Type **TR** *Comment Status* **R** *TP0v method*

Why is the cascaded reference package with test fixture called virtual reference channel, shouldn't this be the DUT reference channel? When testing a real device the package will be DUT package, using reference is confusing as it could imply IEEE COM reference package.

SuggestedRemedy

Repalce virtual with DUT, and replace reference package with DUT package

Response *Response Status* **C**

REJECT.

IEEE 802.3 specifies interfaces not devices.

Cl **163A** *SC* **163A.1** *P* **280** *L* **28** # 276

Dawe, Piers Nvidia

Comment Type **E** *Comment Status* **A** *(bucket1)*

for are

SuggestedRemedy

Delete for?

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change "for are" to "are".

Cl **163A** *SC* **163A.1** *P* **280** *L* **28** # 198

Wu, Mau-Lin MediaTek

Comment Type **E** *Comment Status* **A** *(bucket1)*

It seems that the term "for" in the following sentence is redundant.
"c) The difference between measured and reference values for are computed using the methods defined in 163A.3.2."

SuggestedRemedy

Change the sentence of c) into "c) The difference between measured and reference values are computed using the methods defined in 163A.3.2."

Response *Response Status* **C**

ACCEPT.

Cl **163A** *SC* **163A.1** *P* **280** *L* **47** # 205

Wu, Mau-Lin MediaTek

Comment Type **T** *Comment Status* **R** *TP0v method*

By adopting "TP0v" test fixture methodology, not only ERL, vf, vpeak, but also AC common-mode RMS voltage shall be scaled by IL of TP0v test fixture.

SuggestedRemedy

If we take the V_ACCM as the notation for "AC common-mode RMS voltage", propose to change the blocks of "Measured ERL, V_f, V_peak" & "Reference ERL, V_f, V_peak" in Figure 163A-1 to "Measured ERL, V_f, V_peak, V_ACCM" & "Reference ERL, V_f, V_peak, V_ACCM".
The paragraphs in Annex 163 related to this change shall be modified accordingly. Some new paragraphs may need if necessary.
Plan to provide one contribution, wu_3ck_01_1120.pdf, for more details.

Response *Response Status* **C**

REJECT.

The following presentation was reviewed by the task force:
https://www.ieee802.org/3/ck/public/20_10/wu_3ck_01_1020.pdf

There is no consensus to implement the proposed changes.

Cl **163A** *SC* **163A.2** *P* **281** *L* **3** # 128

Hidaka, Yasuo Credo Semiconductor

Comment Type **T** *Comment Status* **R** *TP0v method*

TP0 is the interface between Transmitter package ball and PCB as shown in Figure 163-3. TP0 is not stable for measurement, because TP0 is highly non-TEM mode. A replica test fixture may have a test point corresponding to TP0, but this cannot be exactly same as TP0 due to the difficulty of measurement at TP0. In order to remind this difference, we should make the label of the test point for replica test fixture different from TP0.
We should not assume replica test fixture is same as actual test fixture.
Also for clarification, I suppose we should differentiate the label of TP0v between the test fixture attached to DUT and the replica test fixture.

SuggestedRemedy

Use TP0r and TP0vr as the labels for the test points where the replica test fixture may be used.

Response *Response Status* **C**

REJECT.

Defining different test point labels is not necessary or helpful. The suggested remedy does not add clarity to the specification.

There is no consensus to make the proposed changes.

Cl **163A** *SC* **163A.2** *P* **281** *L* **4** # 30

Healey, Adam Broadcom Inc.

Comment Type **E** *Comment Status* **A** *TP0v method*

The "test channel" requirements are not defined by the clause that invokes this method but "test fixture" requirements might be. It seems like this is the only place "transmitter test channel" or "test channel" are used. The same entity is referred to as the "TP0-TP0v channel" in 163A.3.1.

SuggestedRemedy

Change the title of 163A.2 to "Test fixture" and replace its contents with the following: "The test fixture is between test points TP0 and TP0v as shown in Figure 163A-2. Test fixture requirements are specified by the clause that invokes this method."

Response *Response Status* **C**

ACCEPT.

Cl **163A** *SC* **163A.3.1** *P* **281** *L* **22** # 277

Dawe, Piers Nvidia

Comment Type **T** *Comment Status* **A** *TP0v method*

I don't like the term "virtual reference channel". It's no more unreal than the other blocks in this figure. I didn't find any other "reference channel" in this draft.

SuggestedRemedy

Change its name to "reference channel" or "reference test channel" throughout.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace "virtual reference channel" with "reference channel".

Implement with editorial license.

Cl **163A** *SC* **163A.3.1** *P* **281** *L* **25** # 35

Healey, Adam Broadcom Inc.

Comment Type **T** *Comment Status* **A** *TP0v method*

In Figure 163A-2, termination resistance at TP0v should represent an instrument and not a device (i.e., it should be the reference resistance R_0 and not the device resistance R_d).

SuggestedRemedy

Replace "R_0" with "R_d".

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace "R_d" at TP0v with "R_0" .

Implement with editorial license.

Cl **163A** *SC* **163A.3.1** *P* **281** *L* **31** # 278

Dawe, Piers Nvidia

Comment Type **T** *Comment Status* **A** *TP0v method*

The material in the NOTE needs to be normative.

SuggestedRemedy

Move it to regular text at line 42

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The response to comment #58 results in similar text being added.

Remove the note from figure 163A-2 and otherwise resolve using the response to comment #58.

Cl **163A** *SC* **163A.3.1** *P* **281** *L* **40** # 58

Ran, Adee Intel

Comment Type **T** *Comment Status* **A** *TP0v method*

"The scattering parameters for the reference package, S(tp), are determined using the method in 93A.1.2, with electrical characteristics specified in the clause that invokes this method"

Typically there are two reference package for the Tx and two possibly other ones for the Rx. It is not stated which one should be used.

A DUT should be allowed to be as "bad" as the worst of the two reference packages for any of the parameters.

Editorially it seems that this should be stated separately in 163A.3.1.1 for v_peak and v_f and in 163A.3.1.2 for ERL (although the same rule applies in both cases).

SuggestedRemedy

Add a sentence in 163A.3.1.1 after the paragraph "The reference pulse response peak (...) is the peak value of h(t)"

such as the following:

"If the invoking clause lists more than one set of reference package parameters, the calculation is performed with each set, and the minimum value is used as the reference value."

Add a similar sentence at the end of 163A.3.1.1 (after the definition of v_f(ref)) and at the end of 163A.3.1.2 (for ERL reference).

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement the suggested remedy.

Update to 163 and 120F to indicate the following:

For reference ERL use both package models and use the worst ERL of the two.

For reference R_peak and v_f, use only the package model with the longer package trace.

Implement with editorial license.

Cl **163A** *SC* **163A.3.1.1** *P* **281** *L* **48** # 36

Healey, Adam Broadcom Inc.

Comment Type **T** *Comment Status* **A** *TP0v method*

Equation (93-17) defines GAMMA1 and GAMMA2 to be equal and furthermore a function of Rd. The termination at the TP0v should represent an instrument load and therefore would be better defined to be R0 independent of Rd.

SuggestedRemedy

Change the first paragraph of 163A.3.1.1 to the following: "Calculate the voltage transfer function, H_21(f) from the scattering parameters of the virtual reference channel, S^(0), using Equation (93A-18) where GAMMA1 is given by Equation (93A-17) and GAMMA2 is set to 0. In Equation (93A-17), the single-ended reference resistance R_0 is set to 50 [Ohms] and the single-ended termination resistance, R_d, specified by the clause that invokes this method."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

The response to comment #277 changed "virtual reference channel" to "reference channel".

Implement the suggested remedy incorporating the response to comment #277.

Cl **163A** *SC* **163A.3.1.1** *P* **282** *L* **5** # 57

Ran, Adee Intel

Comment Type **E** *Comment Status* **A** *(bucket1)*

In "Tr" r should be in subscript.

SuggestedRemedy

per comment.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change the "r" in "Tr" to subscript.

Cl **163A** *SC* **163A.3.1.1** *P* **282** *L* **18** # 38

Healey, Adam Broadcom Inc.

Comment Type **E** *Comment Status* **A** *(bucket1)*

In Equation (163A-3), the upper limit of the summation (N_v) should have a capital "N". In addition, the unit interval symbol (T_b) should have a capital "T".

SuggestedRemedy

Fix the typos.

Response *Response Status* **C**

ACCEPT.

Cl **163A** *SC* **163A.3.1.1** *P* **282** *L* **19** # 199

Wu, Mau-Lin MediaTek

Comment Type **T** *Comment Status* **A** *(bucket1)*

The parameter of "N_v" in the equation (163A-3) had been mistakenly set as "n_v".

SuggestedRemedy

Correct "n_v" as "N_v" in the equation (163A-3)

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement the suggsted remedy with editorial license.

Cl **163A** *SC* **163A.3.1.1** *P* **282** *L* **25** # 39

Healey, Adam Broadcom Inc.

Comment Type **T** *Comment Status* **A** *TP0v method*

The annex is mostly written to be generic so citing the specific value for N_v defined in 162.9.3.1.2 seems out of place. Will the same value of N_v apply to future clauses that may employ this method?

SuggestedRemedy

Change the definition of N_v to the following: "represents the number of symbols to include in the steady state voltage calculation". Add a sentence that the value of N_v is defined by the clause that invokes this method.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement the suggsted remedy with editorial license.

Cl **163A** *SC* **163A.3.1.2** *P* **282** *L* **30** # 37

Healey, Adam Broadcom Inc.

Comment Type **T** *Comment Status* **A** *TP0v method*

Equation (93A-58) and Equation (93A-59) do not calculate the PDTR response from S^(0). There is an additional step required to obtain the reflection coefficient s_ii(f) for the case where R_d is not equal to R_0. Also, the value of T_fx should be 0.

SuggestedRemedy

Replace the contents of 163A.3.1.2 with the following: "The reference reflection coefficient at TP0v is given by Equation (93A-7) where [s_22]^(x) is GAMMA1 as defined by Equation (93A-17) and [s_ji]^(y) are the components of the scattering matrix of the virtual reference channel S^(0). In Equation (93A-17), the single-ended reference resistance R_0 is set to 50 [Ohms] and the single-ended termination resistance, R_d, specified by the clause that invokes this method. The referece pulse time-domain reflection (PTDR) response is computed from the referece reflection coefficient at TP0v using Equation (93A–58) and Equation (93A–59). The reference ERL value is determined from the reference PTDR response using the method in 93A.5.2 with T_fx set to 0 and other parameters specified by the clause that invokes this method."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement the change shown on slide 19 of:
https://www.ieee802.org/3/ck/public/20_10/heck_3ck_01a_1020.pdf

Cl **163A** *SC* **163A.3.2.2** *P* **283** *L* **12** # 59

Ran, Adee Intel

Comment Type **E** *Comment Status* **A** *TP0v method*

Both ERL(ref) and ERL(meas) in equation 163A-6 are undefined terms.

SuggestedRemedy

Add below the equation

"Where
ERL(ref) is the ERL reference value defined in 163A.3.1.2
ERL(meas) is the measured Effective return loss"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement the suggested remedy with editorial license.