Cl **FM**	*SC* **FM**	*P* **1**	*L* **31**	# 26

Ran, Adee — Cisco systems

Comment Type **E**   *Comment Status* **A**   *bucket1*

802.3cv is published.

SuggestedRemedy

Change "IEEE Std 802.3cv-20xx" to "IEEE Std 802.3cv-2021", here and on page 16.

Response   *Response Status* **C**

ACCEPT.

Cl **00**	*SC* **0**	*P* **0**	*L* **0**	# 5

Brown, Matt — Huawei

Comment Type **E**   *Comment Status* **A**   *bucket1*

802.3ck will not be incorporated into the next amendment (802.3dc) so it will be amendment to that revision.

SuggestedRemedy

Convert draft to be an amendment of new revision (802.3dc) rather than an amendment of 802.3-2018.

Response   *Response Status* **C**

ACCEPT.

Cl **00**	*SC* **0**	*P* **0**	*L* **0**	# 20

Brown, Matt — Huawei

Comment Type **E**   *Comment Status* **A**   *bucket1*

According to the style manual subclause 16.4, table notes should be placed as follows: "A table note should be set immediately following the table to which it belongs, enclosed within the boxed table, above the bottom border of the table."
Several table notes were added to several tables in recent drafts but not placed according to this guidance.

SuggestedRemedy

Fix the table note at the following page/line: 169/24, 179/21, 251/46, 255/25, 283/28

Response   *Response Status* **C**

ACCEPT.

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

Cl **80**	*SC* **80.1.5**	*P* **80**	*L* **45**	# 2

Brown, Matt — Huawei

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

In Table 80-4a, 100GAUI-1 C2C and C2M have been added to several PHY types, but the physical layer tables in the corresponding PMD clauses have not been updated.

SuggestedRemedy

Amend the 100 Gb/s physical layer tables in clauses 138 and 140 to include 100GAUI-1 C2C and C2M sublayers.

Response   *Response Status* **C**

ACCEPT.

Cl **116**	*SC* **116.1.4**	*P* **98**	*L* **18**	# 3

Brown, Matt — Huawei

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

In Table 116-3, 200GAUI-2 C2C and C2M have been added to several 200 Gb/s PHY types, but the physical layer tables in the corresponding PMD clauses have not been updated.

SuggestedRemedy

Amend the 200 Gb/s physical layer tables in clauses 121 and 122 to include 200GAUI-2 C2C and C2M sublayers.

Response   *Response Status* **C**

ACCEPT.

Cl **116**	*SC* **116.1.4**	*P* **99**	*L* **18**	# 4

Brown, Matt — Huawei

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

In Table 116-4, 400GAUI-4 C2C and C2M have been added to several 400 Gb/s PHY types, but the physical layer tables in the corresponding PMD clauses have not been updated.

SuggestedRemedy

Amend the 400 Gb/s physical layer tables in clauses 122, 123, 124, 138, 150, and 151 to include 400GAUI-4 C2C and C2M sublayers.

Response   *Response Status* **C**

ACCEPT.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Cl **116**
SC **116.1.4**

Page 1 of 18
2021-08-09 3:27:26 PM

Cl **120**   *SC* **120.5.11.2.a**   *P* **110**   *L* **48**   # 80

Dudek, Mike   Marvell

Comment Type **E**   *Comment Status* **A**   *bucket1*

120.5.7 should be a hot link

SuggestedRemedy

fix it

Response   *Response Status* **C**

ACCEPT.

Cl **120F**   *SC* **120F.3.1**   *P* **232**   *L* **32**   # 76

Dudek, Mike   Marvell

Comment Type **TR**   *Comment Status* **A**   *TX residual ISI*

The value for SNDR is measured using the method in 162.9.3.3 which uses Np=29,
however chip to chip reference receiver is only a 6 tap DFE. Transmitters with significant
residual ISI beyond the length of the DFE will pass this Tx specification and will not work in
the system.

SuggestedRemedy

Add an extra Tx specification "Residual ISI (max) value 0.027". Defined as the value of
Sigma_e/Vpeak where sigma_e and Vpeak are as defined in 162.9.3.3 except that Np=11
is used instead of Np=29.

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

The following presentation was reviewed by the task force:
https://www.ieee802.org/3/ck/public/21_07/dudek_3ck_01_0721.pdf

For the transmitter characteristics for 163 and 120F implement the residual ISI parameter
per the suggested remedy and dudek_3ck_01_0721, except specify as dB (-31 dB) rather
than a ratio (0.027). Implement with editorial license.

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

Cl **120G**   *SC* **120G.3.1**   *P* **250**   *L* **12**   # 121

Dawe, Piers   Nvidia

Comment Type **TR**   *Comment Status* **A**   *AC CM noise*

As discussed, AC common-mode output voltage (max) 17.5 mV isn't reasonable at double
the signalling rate of 120E with the same connectors and layout skew.

SuggestedRemedy

Increase to 25 mV, both host and module output.

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ck D2.1
and D2.0 or the unsatisfied negative comments from the initial ballot.
Hence it is not within the scope of the recirculation ballot.

Resolve using the response to comment #46.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Cl* **120G**   Page 2 of 18
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn   *SC* **120G.3.1**   2021-08-09 3:27:26 PM
SORT ORDER: Clause, Subclause, page, line

Cl **120G**   *SC* **120G.3.1**   *P* **250**   *L* **12**   # `46`

Ran, Adee   Cisco systems

Comment Type   **TR**   *Comment Status*   **A**   AC CM noise

"AC common-mode RMS output voltage (max)" specification of 17.5 mV is not feasible for high-volume, multi-port products. The common-mode output may include a component correlated to the differential output, e.g. from mode conversion on the host channel. A module receiver is expected to be quite tolerant to a correlated common-mode signal.

As suggested in ran_3ck_adhoc_20210630, there are two reasonable alternatives:
a) increase the allowed RMS voltage to 30 mV (as is allowed for the CR transmitter measured on an HCB - likely the same point - and where the common-mode concern is greater due to conversion in the cable assembly).
b) Keep the 17.5 mV specification but only for the component uncorrelated to the differential signal; use the linear fitted pulse response method (which is already referred to in 120G.5.2) to calculate the linear fitted pulse response characteristics of the common-mode output, and define the AC common-mode noise as the RSS of sigma_n and sigma_v.

Note: This comment is only about the host output; module output is more controlled and modules can be designed to have low mode conversion so the correlated component is expected to be small. Modules should not be allowed to generate 30 mV RMS, so if option a is chosen, the module output specification should not be changed.

SuggestedRemedy

Preferably implement option a in the comment.

Response   *Response Status*   **U**

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ck D2.1 and D2.0 or the unsatisfied negative comments from the initial ballot.
Hence it is not within the scope of the recirculation ballot.

Comment 121 proposes to increase the value to 25 mV.

This comment proposes to either:
(a) change the value to 30 mV
(b) change the parameter to relate to only the uncorrelated noise
There is not sufficient evidence that the correlated noise is indeed tolerable by the receiver (e.g., conversion from CM to DM in receiver might be non-linear or CM might have much larger channel transit time than DM)

The resolution to comment #123 indicates there is not consensus to make the change proposed in option (b), above.

Following straw polls #3 and #4, there was consensus to close this comment changing the value to 25 mV.

Change the AC common-mode RMS output voltage (max) for module output and host

output to 25 mV.

Straw poll #3, pick one (direction)
Straw poll #4, Chicago rules (direction)
To address comments #46 and #121, for the module output and host output AC CM noise (max) I would support:
A: no change
B: change to 25 mV
C: change to 30 mV
Straw poll #3
A: 12 B: 13 C: 9
Straw poll #4
A: 15 B: 25 C: 21

Cl **120G**   *SC* **120G.3.1**   *P* **250**   *L* **25**   # `58`

Ghiasi, Ali   Ghiasi Quantum/Inphi

Comment Type   **TR**   *Comment Status*   **A**   HO TT

Transition time host requesting short mode or long mode is for TP4

SuggestedRemedy

Please revert to 10 ps in draft D2.0, please move this parameter to TP4 table 120G-3

Response   *Response Status*   **C**

ACCEPT IN PRINCIPLE.

This comment relates to the host output transition time specified in Table 120G-1.

Separate values for host long and short modes were added per D2.1 comment #188.

The justification was that the host input and host output PCB insertion loss will likely be similar, which is reflected in the transition times chosen for the host input crosstalk calibration. This must also be explicitly allowed and constrained at the hout output.

However, it would be helpful in Table 120G-1 to point to the subclause that defines long and short modes.

Add a footnote to the sub-rows for long and short modes in Table 120G-1 pointing to 120G.3.2.1.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Cl* **120G**   Page 3 of 18
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn   *SC* **120G.3.1**   2021-08-09 3:27:26 PM
SORT ORDER: Clause, Subclause, page, line

Cl **120G**   *SC* **120G.3.1.5**   *P* **252**   *L* **15**   # **8**

Brown, Matt   Huawei

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

Reference to transition time methodology.

SuggestedRemedy

Change "transition time" to "transition time (see 120G.3.1.4)".
Repeat at:
page 254, line 13
page 258, lines 43/44
page 262, lines 10/11

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement the suggested remedy with editorial license.

Cl **120G**   *SC* **120G.3.1.5**   *P* **252**   *L* **16**   # **120**

Dawe, Piers   Nvidia

Comment Type **TR**   *Comment Status* **A**   *test system response*

"without the use of a reference receiver" which occurs several times, is misleading; the BT4 filter, which is the reference receiver response in so many clauses, applies.

SuggestedRemedy

Change to "observed through the Bessel-Thomson response of 120G.3.1 in place of the reference receiver of 120G.5.2" or similar. Several places.

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ck D2.1 and D2.0 or the unsatisfied negative comments from the initial ballot.
Hence it is not within the scope of the recirculation ballot.

There could be some misinterpretation since the reference receiver as defined in 120G.5.2 includes the effect of the test equipement filter. Also, since the response is prescriptive, it should not be in parentheses.
On page 252, line 16…
Change: "calibrated at TP4 (without the use of a reference receiver)"
To: "calibrated at TP4 using a test system with a response as defined in 120G.3.1 rather than the reference receiver of 120G.5.2"
Apply similarly at page/line: 254/12, 258/43, and 262/10.
Implement with editorial license.

Cl **120G**   *SC* **120G.3.2**   *P* **253**   *L* **1**   # **48**

Ran, Adee   Cisco systems

Comment Type **E**   *Comment Status* **A**   *bucket1*

"Table 120G–3—Module output characteristics (at TP4)" - Parentheses are inconsistent with other similar tables (Host output in this annex, and Transmitter characteristics elsewhere).

SuggestedRemedy

Change title to "Module output characteristics at TP4"

Response   *Response Status* **C**

ACCEPT.

Cl **120G**   *SC* **120G.3.2**   *P* **253**   *L* **11**   # **98**

Dawe, Piers   Nvidia

Comment Type **TR**   *Comment Status* **R**   *MO VEC/EH*

If the eye height limit is the same at long near end as at long far end, there is huge margin at near end and the implementer is encouraged to optimise for far end or beyond, only limited by the NE VEC spec, while we want modules to be set up consistently, for the full range from near to far. EH is naturally larger at NE for a well set up output.

SuggestedRemedy

Increase the eye height, long mode near end, by 3 dB from 15 mV to 21 mV

Response   *Response Status* **U**

REJECT.

This comment pertains to the module output eye height (min) for long mode, near end.

The comment does not provide sufficient evidence that the proposed change is necessary.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Cl **120G**
SC **120G.3.2**

Page 4 of 18
2021-08-09 3:27:26 PM

Cl **120G**　　*SC* **120G.3.2**　　　　*P* **253**　　　*L* **11**　　　# 97

Dawe, Piers　　　　　　　　　　Nvidia

Comment Type **TR**　　*Comment Status* **R**　　　　*MO VEC/EH*

The driver swing has to be aggressively reduced from 600 mV pk-pk to deliver only 15 mV at near end, short mode. 120E has 70 mV, and D1.4 had 24 mV, ghiasi_3ck_adhoc_01a_042121 shows 35 mV (before Vpkpk was reduced). Yet a host can usefully optimise for e.g. different crosstalk or noise if given a reasonable signal strength. A NIC has no high-loss ports so it can do this even if a switch won't. There is room to increase this weak signal without overloading the receiver. Also, making the limits more like reality encourages more consistent module setup across the industry.

SuggestedRemedy

Increase the eye height, short mode near end, by 1.1 dB from 15 mV to 17 mV

Response　　　　　　*Response Status* **U**

REJECT.

This comment pertains to the module output eye height (min) for short mode, near end.

The comment does not provide sufficient evidence that the proposed change is necessary.

Cl **120G**　　*SC* **120G.3.2**　　　　*P* **253**　　　*L* **12**　　　# 62

Ghiasi, Ali　　　　　　　　　　Ghiasi Quantum/Inphi

Comment Type **TR**　　*Comment Status* **A**　　　　*MO VEC/EH*

TP4 VEC can be lowered from current 12 dB to 11 dB to allow additional penalty for real host channel and host ASIC

SuggestedRemedy

Reduce TP4 VEC=11 dB, see ghiasi_3ck_01_0721

Response　　　　　　*Response Status* **C**

ACCEPT IN PRINCIPLE.

This comment pertains to the module output VEC (max).

Slides 7 and 8 of the following presentation was reviewed by the task force:
https://www.ieee802.org/3/ck/public/21_07/ghiasi_3ck_01_0721.pdf

The slide shows that with the current g_dc constraints VEC fails for the long mode, near-end measurement. The comment suggests that g_dc max for TP4 far-end be increased from -3 dB to -2 dB. With this change to the g_DC limit there is no need to change VEC (max).

Cl **120G**　　*SC* **120G.3.2**　　　　*P* **253**　　　*L* **20**　　　# 49

Ran, Adee　　　　　　　　　　Cisco systems

Comment Type **TR**　　*Comment Status* **A**　　　*MO DC CM voltage tolerance*

footnote b says "Specification includes effects of ground offset voltage." - what does it mean?

It is unclear why the module needs a specification of DC common-mode voltage at all, given that its output is AC coupled (per 120G.1). Without AC coupling in the module, the limits given in this table are not reasonable.

SuggestedRemedy

Clarify what the quoted sentence mean, or delete it.

Consider removing the DC common mode voltage specification.

Response　　　　　　*Response Status* **C**

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ck D2.1 and D2.0 or the unsatisfied negative comments from the initial ballot.
Hence it is not within the scope of the recirculation ballot.

The comment is referring to module output "DC common-mode voltage" specifications which are intended to define a tolerance for the module output to host DC bias voltage. A DC common-mode voltage tolerance specification is required as the module output, whether it be a discrete capacitor or decoupling on the die, must tolerate the DC common-mode voltage applied by the host input. This is a necessary requirement and thus should not be deleted. However, this specification as written is difficult to interpret.

Implement slide 16 of brown_3ck_02b_0721 with editorial license.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected　　RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Cl **120G**
SC **120G.3.2**

Page 5 of 18
2021-08-09 3:27:26 PM

Cl **120G** *SC* **120G.3.2** *P* **253** *L* **22** # 50

Ran, Adee Cisco systems

Comment Type **ER** *Comment Status* **A** *MO DC CM voltage tolerance*

"DC common-mode voltage (max)" - assuming this specification is not removed, it should refer to footnote b, not footnote a.

SuggestedRemedy

change footnote reference from a to b.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ck D2.1 and D2.0 or the unsatisfied negative comments from the initial ballot.
Hence it is not within the scope of the recirculation ballot.

Resolve using the response to comment #49.

Cl **120G** *SC* **120G.3.2.2.1** *P* **254** *L* **51** # 102

Dawe, Piers Nvidia

Comment Type **TR** *Comment Status* **R** *MO SI host reference channel*

The near end and far end should be placed far enough apart so that the module implementer has little choice what emphasis to use, so that all modules are set up similarly. As short is easier than long, this means that far minus near (mm or dB) for short should be at least as much as far minus near for long. As real host channels are not exactly like the theoretical reference host channel, there should be a healthy overlap of short and long to give the host room for its implementation. D2.0's 160 mm delivered on both these criteria, D2.1's 133 mm doesn't.

SuggestedRemedy

Change 133 to 150, change 80 to 90

Response *Response Status* **U**

REJECT.

The comment does not provide sufficient justification for the proposed changes.

There may be some benefit to balancing the length range between short and long modes. Further analysis is encouraged.

Cl **120G** *SC* **120G.3.3** *P* **255** *L* **34** # 51

Ran, Adee Cisco systems

Comment Type **TR** *Comment Status* **A** *MO AC CM noise tolerance*

The host should tolerate the AC common mode output allowed for the module output. Even if this is not included in the stressed input test, this expectation should be part of the host input specification.

SuggestedRemedy

Add a row to Table 120G–7 with parameter "AC common-mode input voltage tolerance (RMS)" and value based on Table 120G–3.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Comment #55 proposes a similar change to the host input.

Implement slide 19 of brown_3ck_02b_0721 with editorial license.

Strawpoll #8 (decision)
I support addressing comment #51 and #55 using slide 19 of brown_3ck_02b_0721.
Yes: 15
No: 12

Cl **120G** *SC* **120G.3.3.1** *P* **256** *L* **4** # 52

Ran, Adee Cisco systems

Comment Type **E** *Comment Status* **A** *bucket1*

It is preferable to refer to the value in table 120G-7 than to repeat it.

SuggestedRemedy

Change "for any signaling rate in the range
53.125 GBd ± 100 ppm" to "for any signaling rate in the range specified in Table 120G-7".

Response *Response Status* **C**

ACCEPT.

Cl **120G** *SC* **120G.3.3.4.1** *P* **257** *L* **31** # 89

Wu, Mau-Lin MediaTek Inc.

Comment Type **E** *Comment Status* **A** *bucket1*

"host reference channel" here means "reference host channel" in other places. It would be better to align with other places.

SuggestedRemedy

Change "host reference channel" to "reference host channel"

Response *Response Status* **C**

ACCEPT.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Cl **120G** Page 6 of 18
SC **120G.3.3.4.1** 2021-08-09 3:27:26 PM

Cl **120G**　　*SC* **120G.3.3.4.2**　　　　*P* **258**　　　*L* **33**　　　　# 53

Ran, Adee　　　　　　　　　　Cisco systems

Comment Type　**T**　　　*Comment Status*　**A**　　　　　　*HI SI method*

Unlike the jitter levels in step c, the initial signal levels in the calibration procedure are not defined. Using inappropriately low levels can result in bad jitter measurement in step c.

To achieve good jitter measurement, the initial output levels should be as high as possible without exceeding the differential peak to peak specification.

Also applies in module stressed input test, 120G.3.4.2.2.

SuggestedRemedy

Add guidance to step a to use initial signal level as high as possible such that the differential peak-to-peak input voltage tolerance given in Table 120G–9 is not exceeded.

Response　　　　　　*Response Status*　**C**

ACCEPT IN PRINCIPLE.

Implement the suggested remedy with editorial license.

Straw poll #9 (decision)
To address comment #53, I support implementing the suggested remedy.
Yes: 18
No:5

Cl **120G**　　*SC* **120G.3.3.4.2**　　　　*P* **258**　　　*L* **39**　　　　# 72

Dudek, Mike　　　　　　　　　　Marvell

Comment Type　**E**　　　*Comment Status*　**A**　　　　　　*HI SI method*

The final values of jitter used in the test are unlikely to match these values of Jrms and J4u because crosstalk is added in step e and random jitter is adjusted in step g. It would be helpful to the reader to indicate this.

SuggestedRemedy

Add to the end of bullet c. "Note that these are initial jitter values. They will be modified by the addition of crosstalk in step e and adjustment of random jitter in step g" Add this to the end of bullet c on page 262 as well.

Response　　　　　　*Response Status*　**C**

ACCEPT IN PRINCIPLE.

Implement the suggested remedy with editorial license.

Cl **120G**　　*SC* **120G.3.4**　　　　*P* **260**　　　*L* **9**　　　　# 55

Ran, Adee　　　　　　　　　　Cisco systems

Comment Type　**TR**　　　*Comment Status*　**A**　　　　　*MI AC CM noise tolerance*

The module should tolerate the AC common mode output allowed for the host output. Even if this is not included in the stressed input test, this expectation should be part of the module input specification.

SuggestedRemedy

Add a row to Table 120G–9 with parameter "AC common-mode input voltage tolerance (RMS)" and value based on Table 120G–1.

Response　　　　　　*Response Status*　**C**

ACCEPT IN PRINCIPLE.

Comment #51 proposes a similar change to the host input.

Resolve using the response to comment #51.

Cl **120G**　　*SC* **120G.3.4.1**　　　　*P* **260**　　　*L* **30**　　　　# 56

Ran, Adee　　　　　　　　　　Cisco systems

Comment Type　**E**　　　*Comment Status*　**A**　　　　　　*bucket1*

It is preferable to refer to the value in table 120G-9 than to repeat it.

SuggestedRemedy

Change "for any signaling rate in the range
53.125 GBd ± 100 ppm" to "for any signaling rate in the range specified in Table 120G-9".

Response　　　　　　*Response Status*　**C**

ACCEPT.

Cl **120G**　　*SC* **120G.5.2**　　　　*P* **265**　　　*L* **12**　　　　# 105

Dawe, Piers　　　　　　　　　　Nvidia

Comment Type　**TR**　　　*Comment Status*　**R**　　　　　　*RR gdc*

When gDC2 is -2, we allow no more than -(-12-2) = 14 dB of peaking, yet when gDC2 is -3, we allow -(-13-3) = 16 dB, yet the channel loss should not be higher. This doesn't make sense.

SuggestedRemedy

For TP1a, change -12 -12 -13 to -12 -11 -10 or -12 -12 -11 (so the strongest CTLE peaking for the highest two gDC2 categories is the same).

Response　　　　　　*Response Status*　**U**

REJECT.
The comment does not provide sufficient justification for the proposed changes.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general　　　　*Cl* **120G**　　　Page 7 of 18
COMMENT STATUS: D/dispatched A/accepted R/rejected　　RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn　　*SC* **120G.5.2**　　2021-08-09 3:27:26 PM
SORT ORDER: Clause, Subclause, page, line

Cl **120G**   *SC* **120G.5.2**   *P* **265**   *L* **16**   # 103

Dawe, Piers   Nvidia

Comment Type **TR**   *Comment Status* **R**   *RR gdc*

The limits for TP4 gDC, gDC2 should not be the same for short and long output modes.

SuggestedRemedy

Create separate limits for TP4 short and long output modes, so 4 sets for TP4+, in the style of TP1a.

Response   *Response Status* **U**

REJECT.

This comment is a restatement of D2.0 comment #179, which was rejected on the basis of insufficient justification and detail. It adds request to provide 4 sets of values in the style used for TP1a but does not provide specific values. No further justification is provided.

The comment does not provide sufficient justification for the proposed changes nor does the suggested remedy provide sufficient detail to implement.

Cl **120G**   *SC* **120G.5.2**   *P* **265**   *L* **25**   # 104

Dawe, Piers   Nvidia

Comment Type **TR**   *Comment Status* **R**   *RR gdc*

As a lot of the channel for TP4 far-end is known exactly and the max loss to TP4 far end is less than to TP1a, the range of gDC, gDC2 combinations should be a subset of the TP1a ones. As for TP1a, I believe the strongest gDC and gDC2 should add to a constant.

SuggestedRemedy

For Continuous time filter, DC gain for TP4 far-end (gDC), change to a set of limits that depend on gDC2 in the same style as for TP1a, with the strongest gDC and gDC2 adding to a constant. The allowed values should be a subset of those for TP1a.

Response   *Response Status* **U**

REJECT.
This comment is a restatement of D2.0 comment #178, which was rejected on the basis of insufficient justification and detail. No further justification or implementation detail is provided.
The comment does not provide sufficient justification for the proposed changes nor does the suggested remedy provide sufficient detail to implement.

Cl **120G**   *SC* **120G.5.2**   *P* **265**   *L* **51**   # 10

Brown, Matt   Huawei

Comment Type **E**   *Comment Status* **A**   *bucket1*

Method should start at step "a)" not "h)"

SuggestedRemedy

Reformat list to start at "a)".

Response   *Response Status* **C**

ACCEPT.

Cl **120G**   *SC* **120G.5.2**   *P* **266**   *L* **23**   # 106

Dawe, Piers   Nvidia

Comment Type **TR**   *Comment Status* **A**   *EO method*

This draft has a primitive rectangular eye mask spec with mask height = max(EHmin, EA/VECmax) and mask width = 0.1 UI, although it is described as a histogram. Measuring a diamond eye with a rectangular mask is an inefficient, inaccurate way of measuring signal quality and provides weak and uncertain protection against too much jitter. Its effective width is less than its actual because of the 1e-5 probability criterion and the inefficient shape.
De-weighting the sides of the histogram/mask would make this worse, equivalent to increasing the target BER by 10x or so. A higher VEC / smaller EH limit with the rectangular mask would allow more jittered and more varied signals, particularly for very short host channels (see Mike Dudek's work) that can have faster edges than higher loss ones. The target BER is not going to change.
We need an eye mask that's more eye shaped, so that a higher proportion of the samples are near the boundary and contribute to the measurement.

SuggestedRemedy

Change from a 4-cornered mask with corners at t = ts+/-0.05, V = y +/-H/2 to a 10-cornered mask with corners at t = ts+/-0.05, ts+/-1/16, ts+/-3/32, V = y +/-H/2, k +/-H*0.4, y. y is near VCmid, VCupp or VClow (vertically floating, as in D2.1).
H is max(EHmin, Eye Amplitude * 10^(-VECmax/20)). Eye Amplitude is AVupp, AVmid or AVlow, as in D2.1.
This simple scalable method can remain as the EH and VEC limits are revised. Scopes have been measuring with 10-sided masks for many years, it's not more difficult than a rectangular mask and gives better results.

Response   *Response Status* **U**

ACCEPT IN PRINCIPLE.

This comment is a restatement of D2.0 comment #127, which was rejected on the basis of insufficient justification and insufficient analysis to show equivalent or better interoperability.

Straw polls 5, 6, and 7 indicate there is no consesus to make the proposed change. However, the resolution to comment #39 addresses the concern expressed in this comment.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Cl* **120G**   Page 8 of 18
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn   *SC* **120G.5.2**   2021-08-09 3:27:26 PM
SORT ORDER: Clause, Subclause, page, line

Cl **120G**   *SC* **120G.5.2**   *P* **266**   *L* **25**   # 39

Ran, Adee   Cisco systems

Comment Type   **TR**   *Comment Status*   **A**   *EO method*

As has been reported in calvin_3ck_adhoc_01_063021, the authors have been "unable to reliably close the calibration loop on TP1a at 12.5dB VEC with precision lab equipment" for insertion loss of 16.4 dB. This suggests that the VEC specification may be unfeasible.

Allowing a higher (worse) VEC for transmitters (host/module outputs) might pass bad receivers with very closed eyes, which will put more burden on receivers (even if the signal in stressed input test does not change, receivers will have to work with transmitters that have the same VEC due to other reasons, e.g. a "rectangular eye" closed by high noise that can't be equalized, rather than ISI).

Instead of lowering the VEC bar for transmitters, we should look at the definition of VEC and make it more suitable to the expected eye shape of good transmitters after processing with the reference receiver (this shape is not rectangular), taking into account the expected behavior of real receivers.

The calculation of VEC and EH from a CDF accumulated over ts ± 0.05 UI gives the same weight to all phases. This makes sense if the receiver's phase is distributed uniformly in this window; it supposedly makes sense it we don't know where the receiver will sample within this region and account for sampling error. But the eye is not independent of the receiver - it is shaped by the receiver's equalization, and in the reference receiver we assume a certain behavior.

A receiver is expected to optimize its equalization (CTLE+DFE or equivalent) at the sampling point ts - this is part of the measurement procedure (currently steps k and l) - which would result in the maximum vertical opening being at ts. We should assume the average sampling phase is then ts; any difference between the optimized phase and the average phase is an implementation penalty that should be covered by the minimum EH.

A real receiver's CDR does not have a uniform phase distribution around its mean; the probability of sampling at either -0.05 UI or +0.05 UI from ts is smaller than the probability of sampling closer to ts. The rare events where the sample is taken far from ts contribute less to the average BER, so they should be weighted down in the calculation of the CDFs. Having equal weights as in the current method is overly pessimistic in both EH and VEC.

It is therefore proposed to apply a weighting function to the sampled data based on the phase.

SuggestedRemedy

A detailed proposal will be provided in a presentation.

Response   *Response Status*   **C**

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ck D2.1 and D2.0 or the unsatisfied negative comments from the initial ballot.

Hence it is not within the scope of the recirculation ballot.

The following presentation analyzed the effect of the currently specified measurement method. A similar analysis is required to make any changes. Https://www.ieee802.org/3/ck/public/20_10/healey_3ck_01a_1020.pdf

The following presentation was reviewed by the task force: https://www.ieee802.org/3/ck/public/21_07/ran_3ck_01a_0721.pdf

Per straw polls 5, 6, and 7 there was consensus to implement the proposal in ran_01a (slide 9) with sigma_r set to 0.02 UI.

Implement the method in ran_01a (slide 9) with sigma_r set to 0.02 UI.

Straw poll #5 (chicago rules) direction
Straw poll #6 (pick one) direction
For the eye opening method in 120G.5.2 I would support:
A: a weighted method similar to comment #39 and ran_01a
B: a multi-sided eye mask similar to comment #106
C: no change
D: need more information
#5: A: 25 B: 15 C: 13 D: 11
#6: A: 15 B: 8 C: 11 D: 5

Straw poll #7 (decision)
I support resolving comment #39 using the proposal in ran_01a (slide 9) except with standard deviation (sigma_r) of 0.02 UI.
Yes: 21
No: 11

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Cl **120G**   Page 9 of 18
SC **120G.5.2**   2021-08-09 3:27:26 PM

Cl **161**　　*SC* **161.5.2.8**　　　　*P* **134**　　*L* **3**　　　# 18

Brown, Matt　　　　　　　　　　　Huawei

Comment Type **E**　　*Comment Status* **A**　　　　　*bucket1*

To address the editor's note a simple change to 161.5.2.9 can address the main concern of D2.1 Comment #163. The terms "FEC encode" and "Reed-Solomon" encoded should be reconciled. All other references in Clause 161 to encoding are preceded by "Reed-Solomon" not "FEC". The same holds for decoder except for one instance.
Reed-Solomon encoder 3x
Reed-Solomon encoding 1x
Reed-Solomon encoded 2x
Reed-Solomon encode 2x
FEC encoded 1x
Reed-Solomon decode 1x
Reed-Solomon decoding 1x
Reed-Solomon decoder 9x
decoder 1x

SuggestedRemedy

In 161.5.2.9, change "FEC encoded" to "Reed-Solomon" encoded.
In 161.5.3.3 (page 136, line 31), change "decoder" to "Reed-Solomon decoder"

Response　　　　　　　*Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve the first part of the suggested remedy using the response to comment #27.
In 161.5.3.3 (page 136, line 31), change "decoder" to "Reed-Solomon decoder"

Cl **161**　　*SC* **161.5.2.9**　　　　*P* **134**　　*L* **3**　　　# 27

Ran, Adee　　　　　　　　　　　Cisco systems

Comment Type **T**　　*Comment Status* **A**　　　　　*bucket1*

The text can be made more precise to avoid possible confusion of "FEC encoded" vs. "Reed-Solomon encoded" and to clarify where the codewords come from and what is being distributed.

SuggestedRemedy

Change "Once the data has been FEC encoded, two FEC codewords" to "Once the data has been encoded per 161.5.2.8, two resulting codewords"

On line 16, change "Once the data has been Reed-Solomon encoded and interleaved, it shall be distributed" to "tx_out<1087:0> shall be distributed".

Response　　　　　　　*Response Status* **C**

ACCEPT IN PRINCIPLE.

Change "Once the data has been FEC encoded, two FEC codewords" to "Once the data has been Reed-Solomon encoded, two resulting FEC codewords"
On line 16, change "Once the data has been Reed-Solomon encoded and interleaved, it shall be distributed" to "tx_out<1087:0> shall be distributed".

Cl **162**　　*SC* **162.1**　　　　*P* **149**　　*L* **15**　　　# 82

Wu, Mau-Lin　　　　　　　　　　MediaTek Inc.

Comment Type **E**　　*Comment Status* **A**　　　　　*bucket1*

The hyperlink of "Figure 162-1" is not correct. It is linked to Table 162-1.

SuggestedRemedy

Correct the hyperlink of "Figure 162-1".

Response　　　　　　　*Response Status* **C**

ACCEPT.

Cl **162**　　*SC* **162.9.3**　　　　*P* **162**　　*L* **12**　　　# 83

Wu, Mau-Lin　　　　　　　　　　MediaTek Inc.

Comment Type **E**　　*Comment Status* **A**　　　　　*bucket1*

There is no "hyperlink" to 162A.2.

SuggestedRemedy

The hyperlink ot 162A.2 shall be added in the sentence "The transmitter characteristics at TP0 are provided informatively in 162A.2."

Response　　　　　　　*Response Status* **C**

ACCEPT.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general　　　*Cl* **162**　　Page 10 of 18
COMMENT STATUS: D/dispatched A/accepted R/rejected　　RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn　　*SC* **162.9.3**　　2021-08-09 3:27:26 PM
SORT ORDER: Clause, Subclause, page, line

Cl **162**   *SC* **162.9.3**   *P* **163**   *L* **10**   # 123

Mellitz, Richard   Samtec

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

Table 162-10 specifies AC common-mode RMS voltage, vcmi (max) note b just changes to a PRBS13Q with method described in 93.8.1.3. The problem is that coherent CM signal are included in differential measurements like SNDR, Jitter, and Linear fit pulse peak ratio. That means it is the coherent part if AC CM is double counted.

SuggestedRemedy

Add note to line 10 (vcmi) indicating that the CM mode measurement is only for the non-coherent CM part of the measurement.

This applies to Tables 163-5, 120F-1, 120G-1, and 120G-3

Response   *Response Status* **U**

REJECT.

[Editor's note: Changed clause/subclause from 163/163.9.3.]

This comment does not apply to the substantive changes between IEEE P802.3ck D2.1 and D2.0 or the unsatisfied negative comments from the initial ballot.
Hence it is not within the scope of the recirculation ballot.

The following presentation was reviewed by the task force:
https://www.ieee802.org/3/ck/public/21_07/mellitz_3ck_01a_0721.pdf.
Resolve in conjunction with comment #46.

Based on straw poll #2, there is not sufficient consensus to implement the proposed changes.

Straw poll #1 (direction)
I would support the AC CM voltage test methodology in Comment #123 and the related presentation mellitz_3ck_01_0721.
Yes: 18
No: 6
Need more information: 13
Abstain: 3

Straw poll #2 (decision)
For the resolution of comment #123, I support adopting the AC CM voltage test methodology in Comment #123 and the related presentation mellitz_3ck_01a_0721.
Yes: 15
No: 16

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

Cl **162**   *SC* **162.9.3**   *P* **163**   *L* **15**   # 99

Dawe, Piers   Nvidia

Comment Type **E**   *Comment Status* **A**   *bucket1*

Now that we have established a consistent way of naming these return losses, let's make it easier for the reader to find them.

SuggestedRemedy

Please add "RLcc", "RLdc" and so on in the table rows as we do for ERL, VEC, vf and others, throughout the draft. Also in running text such as 162.9.3.6. Similarly Rpeak.

Response   *Response Status* **C**

ACCEPT.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Cl* **162**   Page 11 of 18
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn   *SC* **162.9.3**   2021-08-09 3:27:26 PM
SORT ORDER: Clause, Subclause, page, line

Cl **162**   *SC* **162.9.3.1.1**   *P* **165**   *L* **5**   # 29

Ran, Adee   Cisco systems

Comment Type **TR**   *Comment Status* **R**   *Np value*

Here it is stated that Np takes the value 29, but this value is only effective for calculation of SNDR. Other invocations of this procedure, for vf and vpeak, use Nv=200 instead. Nv appears several times and looks like a parameter, but it is not - it is a value that replaces Np; this is not stated anywhere.

In the remaining use of the linear fit, for calculation of the equalizer coefficients used in 162.9.3.1.3, 162.9.3.1.4, and 162.9.3.1.5, it does not matter whether 29 or 200 UI are used. So Np=29 is important only for SNDR, which is the exception.

Having two parameters instead of one parameter which takes two values is unnecessary and confusing.

SuggestedRemedy

In 162.9.3.1.1, change "Np=29" to "Np=200".

In 162.9.3.3 (Output SNDR) change "with the exception that the linear fit procedure in 162.9.3.1.1 is used" to "with the exception that the linear fit procedure in 162.9.3.1.1 is used with Np=29 instead of 200".

In 162.9.3.1.2 (Steady-state voltage and linear fit pulse peak) delete "using Nv=200".

In 163.9.2.3 (Difference steady state voltage) delete "with Nv = 200".

In 163A.3.1.1 (Steady-state voltage and pulse peak reference values) change "Nv" to "Np" (3 times).

In 163B.2 (Characteristics) delete "With Nv = 200".

With editorial license, change any remaining occurrence of Nv to Np.

Response   *Response Status* **U**

REJECT.

The following presentation was reviewed by the task force at a previous ad hoc meeting. https://www.ieee802.org/3/ck/public/adhoc/july14_21/wu_3ck_adhoc_01a_071421.pdf.

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

[Editor's note: CC: 162, 163, 163A, 163B]

Cl **162**   *SC* **162.9.3.4**   *P* **168**   *L* **22**   # 24

Hidaka, Yasuo   Credo Semiconductor, Inc.

Comment Type **E**   *Comment Status* **A**   *bucket1*

164 on the row F10 and the column of index of last symbol is a typo.

SuggestedRemedy

Change 164 with 264.

Response   *Response Status* **C**

ACCEPT.

Cl **162**   *SC* **162.9.4.1**   *P* **171**   *L* **4**   # 33

Ran, Adee   Cisco systems

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

"This translates to a nominal unit interval of 18.82353 ps" - even with 5 digits after the decimal, this is not the nominal unit interval but an approximation.

In fact, 4 digits (0.1 fs resolution) result in about 1 ppm error, which is sufficient for any practical purpose.

SuggestedRemedy

Change "18.82353" to "approximately 18.8235".

Response   *Response Status* **C**

ACCEPT.

Cl **162**   *SC* **162.9.4.3.3**   *P* **172**   *L* **25**   # 6

Brown, Matt   Huawei

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

Transition time is referred to here as "20% to 80% transition time". It is defined explicitly in 120E.3.1.5. Transition time is usually referred to elsewhere in draft as just "transition time". Align terminology.

SuggestedRemedy

Change "20% to 80% transition time" to "transition time"

Response   *Response Status* **C**

ACCEPT.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Cl **162**
SC **162.9.4.3.3**

Page 12 of 18
2021-08-09 3:27:26 PM

Cl **162**   *SC* **162.9.4.3.3**   *P* **173**   *L* **38**   # 113

Dawe, Piers   Nvidia

Comment Type **E**   *Comment Status* **A**   broadband noise (bucket2)

"sigma_bn is the RMS broadband noise amplitude" means nothing because the text
doesn't call it that.

SuggestedRemedy

Add "RMS broadband noise amplitude" to the text where sigma_bn is mentioned (step g).

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement the suggested remedy with editorial license.

Cl **162**   *SC* **162.9.4.4.2**   *P* **175**   *L* **18**   # 85

Wu, Mau-Lin   MediaTek Inc.

Comment Type **E**   *Comment Status* **A**   bucket1

The reference here is missed in D2.1. It's (see 162.9.4.3.4 in D2.0). No comments were
accepted to change this in D2.0.

SuggestedRemedy

Change "(see)" to "(see 162.9.4.3.4)"

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

Reference to 162.9.4.3.4 is not helpful since that subclause does not address added
sinusoidal jitter. Given that the previous subclause 162.9.4.4.1 describes the test setup
including sinusoidal jitter this reference can be deleted.
Delete "(see)".

Cl **162**   *SC* **162.11.7**   *P* **183**   *L* **39**   # 95

Dawe, Piers   Nvidia

Comment Type **TR**   *Comment Status* **R**   COM bbgmax

The normalized DFE coefficient minimum limit bbmin for taps 3 to 12 is -0.03. It doesn't
make sense that taps 13 to 40 could be worse, -0.05. If I have understood the data
correctly, the example channels we have don't need this. (Remember, these are reference
receiver limits not hard cable or channel limits anyway; a cable or channel can go beyond a
tap limit if it makes up the COM another way, e.g. with acceptable crosstalk.)

SuggestedRemedy

Change bgmax 0.05 to bbgmax 0.05, bbgmax -0.03. Also in 163.

Response   *Response Status* **U**

REJECT.

This comment does not apply to the substantive changes between IEEE P802.3ck D2.1
and D2.0 or the unsatisfied negative comments from the initial ballot.
Hence it is not within the scope of the recirculation ballot.

The following presentation showed that some backplane channels had floating tap
coefficient values of <-0.03.
https://www.ieee802.org/3/ck/public/19_09/heck_3ck_01_0919.pdf
The comment does not provide an assessment of the impact to those channels.
[Editor's note: CC: 162, 163]

Cl **162**   *SC* **162.11.7.1**   *P* **184**   *L* **7**   # 81

Dudek, Mike   Marvell

Comment Type **E**   *Comment Status* **A**   bucket1

93A.1.2.3, Equation 93A-13, 93A-14 and Table 162-19 should be hot links or green text.

SuggestedRemedy

fix them

Response   *Response Status* **C**

ACCEPT.

Cl **162**   *SC* **162.11.7.1**   *P* **184**   *L* **8**   # 86

Wu, Mau-Lin   MediaTek Inc.

Comment Type **E**   *Comment Status* **A**   bucket1

There is no "hyperlink" to Table 162-19.

SuggestedRemedy

Add hyperlink to Table 162-19

Response   *Response Status* **C**

ACCEPT.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Cl* **162**   Page 13 of 18
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn   *SC* **162.11.7.1**   2021-08-09 3:27:26 PM
SORT ORDER: Clause, Subclause, page, line

Cl **162A**   *SC* **162A.5**   *P* **277**   *L* **30**   # 11

Brown, Matt   Huawei

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

The acronym "IL" is often used to represent "insertion loss" in text, but is never formally introduced.

SuggestedRemedy

Either introduce it properly, e.g., "insertion loss (IL)" or expand it everywhere.

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

Introduce the acronym properly, e.g., "insertion loss (IL) with editorial license.

Cl **162B**   *SC* **162B.1.2.1**   *P* **280**   *L* **41**   # 12

Brown, Matt   Huawei

Comment Type **E**   *Comment Status* **A**   *bucket1*

Ilcatf and f should be italic.

SuggestedRemedy

Format as italic.

Response   *Response Status* **C**

ACCEPT.

Cl **162B**   *SC* **162B.1.3.5**   *P* **286**   *L* **43**   # 15

Brown, Matt   Huawei

Comment Type **T**   *Comment Status* **R**   *transition time*

Measurement method for transition times is never specified. I assume it is the same as for PMD specifications per 120E.3.1.5. To be consistent with other clauses and annexes should be "transition time" not "rise and fall timers". Given explicit methodology in 120E.3.1.5 and to be common with other clauses can delete "20% to 80%" since this is helpful but not complete.

SuggestedRemedy

With editorial license specify that the transition time is measured according to 120E.3.1.5. Throughout 162B, change "20% to 80% rise and fall times" to "transition time".

Response   *Response Status* **C**

REJECT.

The parameter names should not be changed as they relate to specific parameters in a referenced calculation.

Cl **163**   *SC* **163.9.2**   *P* **199**   *L* **46**   # 110

Dawe, Piers   Nvidia

Comment Type **T**   *Comment Status* **A**   *TX RLcc*

2 dB RLcc is very weak. We have such a lenient spec in C2M and CR because that's what front-panel connectors do; here, there is no connector in the DUT.

SuggestedRemedy

Change to 3 +0.01f dB or whatever is reasonable for an IC and package. The 0.01 can be expressed as a fraction of test fixture loss.

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

Set RLcc (min) to 3.25 dB.

Cl **163**   *SC* **163.9.2**   *P* **200**   *L* **5**   # 19

Brown, Matt   Huawei

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

Table 163-5 is a normative table, but footnote c relating to transmitter waveform is a recommendation.

SuggestedRemedy

Convert footnote c to a table note (see style manual 16.4) or delete footnote c.

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

This can also be fixed by placing the recommendation in regular text.
The comment equally applies to footnote c in Table 162-10.
Remove footnote c from Table 163-5 and Table 162-10 and add a new sentence to the end of the first paragraph in 162.9.3.1.4 as follows:
"It is recommended that the same step size is used for all coefficients."

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Cl **163**
SC **163.9.2**

Page 14 of 18
2021-08-09 3:27:26 PM

Cl **163** *SC* **163.9.2**   *P* **200** *L* **12** # 75

Dudek, Mike   Marvell

Comment Type **TR** *Comment Status* **A**   *TX residual ISI*

In dudek_3ck_01_0521 it was shown that with larger values of Cp it is possible to have transmitters that pass all the transmitter specifications but only provide 1.5dB COM on channels that pass the channel specifications. This was confirmed in li_3ck_adhoc_01_063021. In Li_3ck_adhoc_01_063021 it was also shown that a tightening of ERL specifications to fail these bad transmitters would also fail transmitters with varying values of Rd and other paramters that give 3.0dB COM on these same channels. Another Tx parameter is needed to fail the high Cp Tx's while still passing the Tx's with variable Rd.   A presentation will be made in support of this comment.

SuggestedRemedy

Add an extra Tx specification "Residual ISI (max) value 0.027". Defined as the value of Sigma_e/Vpeak where sigma_e and Vpeak are as defined in 162.9.3.3 except that Np=11 is used instead of Np=29.

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

[Editor's note: Changed page from 199.]

This comment does not apply to the substantive changes between IEEE P802.3ck D2.1 and D2.0 or the unsatisfied negative comments from the initial ballot.
Hence it is not within the scope of the recirculation ballot.

Resolve using the response to comment #76.

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

Cl **163** *SC* **163.9.2**   *P* **200** *L* **12** # 17

Brown, Matt   Huawei

Comment Type **E** *Comment Status* **A**   *table footnote (bucket2)*

For the SNDR specification in Table 163-5, footnote d is redundant. The reference column points to 162.9.3.3 which provides the exact same information as footnote a.

SuggestedRemedy

Delete footnote a.

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #77.

Cl **163** *SC* **163.9.2**   *P* **200** *L* **21** # 77

Dudek, Mike   Marvell

Comment Type **E** *Comment Status* **A**   *table footnote (bucket2)*

Footnote d to table 163-5 just duplicates the information in the short section that this footnote refers to.

SuggestedRemedy

Delete the footnote.

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

Similar footnote "d" in Table 162-10 and Table 120F-1 is also redundant and thus should be deleted as well.

Delete footnote d in Table 162-10, Table 163-5, and Table 120F-1.

Cl **163** *SC* **163.9.2.1.3**   *P* **201** *L* **27** # 117

Dawe, Piers   Nvidia

Comment Type **TR** *Comment Status* **A**   *TF RLcc (bucket2)*

Test fixture common-mode to common-mode return loss should be way better than the worst module connector! And needs to be significantly better than the spec for the IC+TF.

SuggestedRemedy

Change 2 to something sensible

Response   *Response Status* **U**

ACCEPT IN PRINCIPLE.

This comment does not apply to the substantive changes between IEEE P802.3ck D2.1 and D2.0 or the unsatisfied negative comments from the initial ballot.
Hence it is not within the scope of the recirculation ballot.

This comment does not provide sufficient details for implementation.

The test fixture RLcc value is too small to permit measurement of a transmitter RLcc as specified. However, there is no consensus on an appropriate new specification. Further analysis and consensus is required.

Add an editor's note pointing out the issue as above calling for contributions to address this.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Cl **163**
SC **163.9.2.1.3**

Page 15 of 18
2021-08-09 3:27:26 PM

Cl **163** *SC* **163.9.3.1** *P* **202** *L* **37** # 34

Ran, Adee Cisco systems

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

It is preferable to refer to the value in table 163-8 than to repeat it. (The NOTE can stay as it is).

SuggestedRemedy

Change "for any signaling rate in the range
53.125 GBd ± 100 ppm" to "for any signaling rate in the range specified in Table 163-8".

Response *Response Status* **C**

ACCEPT.

Cl **163** *SC* **163.9.3.5** *P* **204** *L* **39** # 7

Brown, Matt Huawei

Comment Type **E** *Comment Status* **A** *transition time*

Transition time is presumably per the method in 120E.3.1.5 for all instances in this subclause. Also, given that transition time is fully defined in 120E.3.1.5 and the common term used in the draft is simply "transition time", "20% to 80% transition time" should be "transition time".

SuggestedRemedy

On page 204 line 39, change "transition time" (first instance) to "transition time (see 120E.3.1.5)".
On page 204 line 45 change "20% to 80% transition time" to "transition time (see 120E.3.1.5)".
Consider adding text in one place specifying that transition time is per 120E.3.1.5 so this does not have to be repeated multiple times.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #73.

Cl **163** *SC* **163.9.3.5** *P* **204** *L* **45** # 73

Dudek, Mike Marvell

Comment Type **TR** *Comment Status* **A** *transition time*

The filtered Ht(f) should be using the transition time of the signal generator, however the measured transition time might be interpreted as measured with the 40GHz 3dB bandwidth used for all Tx measurements. Also nothing is stated as to how the signal is measured at the transmitter output and what the Tx FFE is set to.

SuggestedRemedy

Change "where Tr is the same as the measured 20% to 80% transition time of the signal at the transmitter output" to "where Tr is the same as the measured transition time of the signal at the transmitter output corrected for the measurement bandwidth. The transition time is measured using the method in 120E.3.1.5 with a 40GHz 3dB bandwidth and the risetime is corrected to remove the effect of this measurement bandwidth.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement the following with editorial license:

In the first sub-bullet on item e, insert: "Tr is determined at the die bump and defined according to the method in 120G.3.1.4 except there is no observation filter."

In the second sub-bullet on item e replace:
"where Tr is the same as the measured 20% to 80% transition time of the signal at the transmitter output."
with
"where Tr is the transmitter transition time, which is measured using the method in 120G.3.1.4 and adjusted to remove the effect of the observation filter."

In the third sub-bullet on item e replace:
"is equal to the transmitter transition time measured at TP0v using the method in 120E.3.1.5 with the transmitter equalizer turned off."
with
"is the transmitter transition time measured at TP0v with the transmitter equalizer turned off, using the method in 120G.3.1.4 and adjusted to remove the effect of the observation filter."

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Cl **163**
SC **163.9.3.5**

Page 16 of 18
2021-08-09 3:27:26 PM

Cl **163**   *SC* **163.9.3.5**   *P* **204**   *L* **50**   # 74

Dudek, Mike   Marvell

Comment Type **TR**   *Comment Status* **A**   *transition time*

The method of measuring the transition time in 120E.3.1.5 uses a 33GHz measurement filter in the measurement which isn't appropriate for 100G PAM4 however bullet k states that the 40GHz 3dB bandwidth is used. The method in 163A.3.1.3 does not have any measurement filter. These need to be the same.

SuggestedRemedy

Change "is equal to the transmitter transition time measured at TP0v using the method in 120E.3.1.5 with the transmitter equalizer turned off." to "is equal to the transmitter transition time measured at TP0v with the transmitter equalizer turned off. The transition time is measured using the method in 120E.3.1.5 with a 40GHz 3dB bandwidth and the risetime is corrected to revmoe the effect of this measurement bandwidth.

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

Resolve using the response to comment #73.

Cl **163**   *SC* **163.9.3.5**   *P* **204**   *L* **51**   # 35

Ran, Adee   Cisco systems

Comment Type **E**   *Comment Status* **A**   *RIT TX off*

"with the transmitter equalizer turned off" - preferably be consistent with most other places in this draft which use the wording "set to preset 1 (no equalization)".

Also is 162.9.4.3.3 with a variation on the wording - preferably change that one too.

SuggestedRemedy

Use the term "preset 1 (no equalization)" in all places.

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.
[Editor's note: CC: 163, 162]

In 162.9.4.3.3, 162.9.4.3.5, and 163.9.3.5, and elsewhere if appropriate, change the text to the following:

"with transmitter equalization off by setting coefficients to preset 1 values (see 162.9.3.1.3)"

Implement with editorial license.

Cl **163**   *SC* **163.9.3.5**   *P* **205**   *L* **30**   # 44

Ran, Adee   Cisco systems

Comment Type **E**   *Comment Status* **A**   *bucket1*

"Q3d" is formatted with inconsistent roman/italic font.

SuggestedRemedy

For consistency with clause 162, use italics for all occurrences of Q3d.

Response   *Response Status* **C**

ACCEPT.

Cl **163**   *SC* **163.9.3.5**   *P* **205**   *L* **31**   # 25

Hidaka, Yasuo   Credo Semiconductor, Inc.

Comment Type **E**   *Comment Status* **A**   *bucket1*

Symbol Q3 remains in NOTE 1.

SuggestedRemedy

Change Q(Q3) with Q(Q3d).

Response   *Response Status* **C**

ACCEPT.

Cl **163A**   *SC* **163A.3.1.1**   *P* **307**   *L* **33**   # 91

Wu, Mau-Lin   MediaTek Inc.

Comment Type **E**   *Comment Status* **A**   *language (bucket2)*

For the definition of N_v here, it would be better to change it from "represents the number of symbols to include in the steady-state voltage calculation" to "represents the number of symbols to be included in the steady-state voltage calculation".

SuggestedRemedy

Change from "represents the number of symbols to include in the steady-state voltage calculation" to "represents the number of symbols to be included the steady-state voltage calculation"

Response   *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change the definition to:
"represents the number of symbols included in the steady-state voltage calculation"

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn
SORT ORDER: Clause, Subclause, page, line

Cl **163A**
SC **163A.3.1.1**

Page 17 of 18
2021-08-09 3:27:26 PM

Cl **163A**   *SC* **163A.3.1.3**   *P* **308**   *L* **52**   # 23

Hidaka, Yasuo   Credo Semiconductor, Inc.

Comment Type   **T**   *Comment Status* **A**   *language (bucket2)*

There may be more than two sets of reference package parameters. Also, this should be taken from the transmitter package parameter.

SuggestedRemedy

Change "the longer package trace length" with "the longest transmitter package trace length".

Apply the same change to page 307 line 36.

Response   *Response Status* **C**

ACCEPT.

Cl **163A**   *SC* **163A.3.2.2**   *P* **309**   *L* **33**   # 43

Ran, Adee   Cisco systems

Comment Type   **E**   *Comment Status* **A**   *language (bucket2)*

"Measure the ERL using the method defined in 93A.5" is phrased as a test procedure. But this should be just a definition of the difference parameter.

The reference to 93A.5 should be in the definition of ERL(meas).

SuggestedRemedy

Delete the quoted sentence.

Change "ERL(meas) is the measured ERL" to "ERL(meas) is the ERL calculated from measurement as defined in 93A.5)".

Response   *Response Status* **C**

ACCEPT.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Cl* **163A**   Page 18 of 18
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn   *SC* **163A.3.2.2**   2021-08-09 3:27:26 PM
SORT ORDER: Clause, Subclause, page, line