

P802.3ds D1.2 200 Gb/s per Wavelength MMF PHYs Task Force 3rd Task Force review comments

Cl 1 SC 1.4 P18 L24 # 29
 Murty, Ramana Broadcom
 Comment Type E Comment Status X
 Description of MR1, SR1-30 and SR1-50 PMDs
 SuggestedRemedy
 Replace "multimode fiber" with "one multimode fiber in each direction" for the MR1, SR1-30 and SR1-50 PMDs
 Proposed Response Response Status O

Cl 45 SC 45.2.1.6 P23 L16 # 49
 Dudek, Mike Marvell
 Comment Type E Comment Status X
 800GBASE-SR4-50 PMA/PMD is a new type.
 SuggestedRemedy
 Underline this row like the others.
 Proposed Response Response Status O

Cl 45 SC 45.2.1.60g.1 P28 L17 # 60
 Bernier, Eric Huawei
 Comment Type ER Comment Status X
 typo 200GBASE-SR1-30
 SuggestedRemedy
 change to 200GBASE-MR1
 Proposed Response Response Status O

Cl 45 SC Table 45-58g P28 L1 # 59
 Bernier, Eric Huawei
 Comment Type TR Comment Status X
 A row is missing in Table 45-58g for bit 1.78.2. This bit is described in the text below the table but is absent from the table.
 SuggestedRemedy
 Add a new row to Table 45-58g for bit 1.78.2 preceeding row for bit 1.78.1 as follows:
 Bit: 1.78.2
 Name: 200GBASE-MR1 ability
 Description:
 1 = PMA/PMD is able to perform 200GBASE-MR1
 0 = PMA/PMD is not able to perform 200GBASE-MR1
 R/W: RO
 Proposed Response Response Status O

Cl 116 SC 116.1.3 P30 L39 # 44
 Simms, William NVIDIA
 Comment Type ER Comment Status X
 In the 400GBASE-SR2-50 row of Table 116-2 the rate is given as "400 Gb/ PHY", missing the "s". Every other row in Tables 116-1, 116-2, 169-1 and 174-1 reads "Gb/s" or "Tb/s".
 The row was reworded in response to D1.1 comment 1, so this looks like collateral from that edit.
 SuggestedRemedy
 Change "400 Gb/ PHY" to "400 Gb/s PHY".
 Proposed Response Response Status O

Cl 169 SC 169.1.4 P39 L24 # 52
 Dudek, Mike Marvell
 Comment Type E Comment Status X
 The clause 177 inner FEC is not used for any of the PHYs in table 169-3aa
 SuggestedRemedy
 Delete the column in this table.
 Proposed Response Response Status O

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Cl 169 SC 169.1.4 P40 L19 # 53
 Dudek, Mike Marvell
 Comment Type TR Comment Status X
 The clause 177 inner FEC is being shown as Mandatory for 800GBASE-SR4-50, SR4-30 or MR4 whereas it is not used according to Clause 193 table 193-2, or 194-2
 SuggestedRemedy
 Delete the Ms
 Proposed Response Response Status O

Cl 169 SC 169.4 P40 L42 # 50
 Dudek, Mike Marvell
 Comment Type TR Comment Status X
 The number of pause quanta was corrected to 116 in 802.3dj Draft 3.2. Note it is also correct in 193.4.1 and 194.4.1
 SuggestedRemedy
 Change the number of pause quanta from 96 to 116 on rows 42, 45, 48 and 49.
 Proposed Response Response Status O

Cl 174 SC 174.1.4 P44 L23 # 51
 Dudek, Mike Marvell
 Comment Type TR Comment Status X
 The clause 177 inner FEC is being shown as Mandatory for 1.6TBASE-SR8-50 whereas it is not used according to Clause 193
 SuggestedRemedy
 Delete the M
 Proposed Response Response Status O

Cl 193 SC 193.2 P49 L47 # 80
 Dawe, Piers Nvidia
 Comment Type ER Comment Status X
 The logic of this subclause is obscured. The idea is that we have an FLR expectation, which is translated to a PHY receiver BLER expectation, which is further translated to a PMD receiver BLER expectation using the BERadded method. But the second and third paragraphs in this subclause are out of order.
 SuggestedRemedy
 Swap the second and third paragraphs so that the logic behind these requirements is more apparent.
 Similarly in Clause 194.
 Proposed Response Response Status O

Cl 193 SC 193.2 P49 L47 # 79
 Dawe, Piers Nvidia
 Comment Type TR Comment Status X
 174A, particularly Table 174A-1, lays out the standard error allocations for the sublayers in a PHY. This paragraph 193.2 "a PMD receiver is expected" is applicable to pluggable modules where the decisions are made in the module, errors can be counted at its PMA, and some error budget is reserved for the following AUIs in the receive path. But it is not correct for RTL, LPO, NPO and CPO, where there is no C2M AUI. For some of these, a different BERadded should be used, and for others, the PCS method at line 45 is more relevant.
 SuggestedRemedy
 Either:
 Add this information in 193.9.14 (see another comment) and refer to it here.
 Or:
 Change the second paragraph to:
 With a compliant input signal, a PMD receiver is expected to meet the block error ratio (BLER) of 1.45×10^{-11} (see 174A.6), measured at the PMA adjacent to the PMD using the method described in 174A.9, with the appropriate BERadded. For a receiver in a module with an AUI C2M, BERadded is 6.4×10^{-5} . For a receiver where the PMA adjacent to the PMD is the final PMA in the receiver (e.g. in a host ASIC), BERadded is 3.2×10^{-5} . For a receiver where the PMA adjacent to the PMD is followed by an AUI C2C then the final PMA in the receiver, BERadded is 5×10^{-5} .
 Similarly in Clause 194.
 Proposed Response Response Status O

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CI 193 SC 193.5.1 P53 L9 # 82

Dawe, Piers

Nvidia

Comment Type TR Comment Status X

In previous optical PMD specifications, signal detect and SIGNAL_OK were the same thing. 178B.8 changes this. This Figure 193-2 shows the signal detect after the usual AND gate at the bottom of the diagram, but an unconnected SIGNAL_OK at the top of the diagram. But these are connected in 178B; most of the ILT/RTS functions can be asleep until signal detect reports that there is light coming in, and if the light goes away, the SIGNAL_OK must revert to not OK. 178B.8.3 specifies this (see rx_ok in 178B.8.3.1).

Further, "it shall be set to false when an input signal corresponding to tx_disable = true in the peer is received for 100 ms ... or longer". This is in contradiction to normal practice, defined in 193.5.5 "This standard imposes no response time requirements on the generation of the PMD_signal_detect_i variable".

Both the clause and the annex agree that various implementations are allowed, and there is no time limit for the signal detect's response when the light appears.

Note that the latency involved in reporting something to MDIO or I2C is a different topic.

SuggestedRemedy

Show signal detect as an input to "ILT/RTS functions".

Review the signal detect timing criterion in 178B.8.3; then modify the sentence "This standard imposes no response time requirements on the generation of the PMD_signal_detect_i variable" in 193.5.5 to say what the timing requirements for this clause are, for transitions to and from OK.

Add a cross-reference to 178B.8.3.

If the limits chosen for this clause are an exception to 178B.8.3, say so.

Similarly in Clause 194

Proposed Response Response Status O

CI 193 SC 193.5.4 P54 L33 # 40

Simms, William

NVIDIA

Comment Type TR Comment Status X

The draft records an unresolved internal discrepancy in the signal detect definition:

"[Editors' note: There is an apparent discrepancy between this and the use of local_rx_ready in 178B.8.3.1 ... in 193.5.5.]" D1.1 comments 126, 127 and 128 raising the interaction between signal detect and the training and startup state machines were rejected on the grounds that Annex 178B belongs to P802.3dj and that any P802.3ds-specific issue should be proposed as an exception. The editors' note is an acknowledgement that there is now a P802.3ds-specific discrepancy, which changes the basis of that rejection. The same applies at CI 194 SC 194.5.4 P89 L39-40.

SuggestedRemedy

Resolve the discrepancy in this draft, either by correcting 193.5.4 and 193.5.5 or by adding the exception to Annex 178B that the D1.1 responses invited. If it is to be fixed in P802.3dj instead, say so in the note and record the dependency.

Proposed Response Response Status O

CI 193 SC 193.5.4 P54 L33 # 58

Dudek, Mike

Marvell

Comment Type T Comment Status X

local_rx_ready in 178B.8.3.1 is a very different variable than Global signal detect. As stated in 178B.7.5.1 it indicates that the local receiver has completed training and it is set via the training control state diagram.

SuggestedRemedy

Delete the editor's note.

Proposed Response Response Status O

CI 193 SC 193.5.12 P56 L2 # 23

Ghiasi, Ali

Ghiasi Qunatum/Marvell

Comment Type TR Comment Status X

200G MMF can benefit enabling Presets in the O1 training format. Define O2 training frame in annex 178B to enable presets with different overshoot, power, and inner/outer eye adjustment

SuggestedRemedy

Need to define O2 training frame and replace O1 with O2, see ghiasi_3ds_01_2609

Proposed Response Response Status O

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CI 193 SC 193.5.12 P56 L8 # 83

Dawe, Piers

Nvidia

Comment Type TR Comment Status X

178B.7 p 879 line 41 says "Recovery from the ISL_FAIL state in the training control state diagram (Figure 178B-10b) requires management to assert mr_restart_training or reset; the timing of this action is implementation dependent and beyond the scope of this standard" which sounds permanent or at least aggravating. It seems to imply that if the light appears then disappears then reappears (e.g. someone has unplugged an optical connector then plugged it in again), the receiver is locked out. 178B is in the P802.3dj draft. We had thought that 3dj presentations osorio_3dj_01_2607 and ran_3dj_05a_2607 would address this issue but it is not clear to me that they did.

SuggestedRemedy

I suspect should say that if the link was up and signal_detect transitions from OK to not, the state diagram should be restarted, or whether it should stay down until the return of the optical signal causes something else to restart it. Until P802.3dj has a satisfactory explanation of such fault recovery, add material in P802.3ds (193 and 194) to address the issue.

Proposed Response Response Status O

CI 193 SC 193.5.12 P56 L10 # 75

Dawe, Piers

Nvidia

Comment Type TR Comment Status X

The way APSU is described doesn't make sense because a PMD is an unretimed thing as the base 802.3 make clear (it converts between electrical and optical and, for PAM2, provides a limiting / clipping function), while the PMA provides the retiming function. Generating patterns is a PMA function that a PMD cannot do, being unretimed.

SuggestedRemedy

This should be fixed in P802.3dj, otherwise P802.3ds would need to write out an 802.3-compliant APSU. Similarly in Clause 194.

Proposed Response Response Status O

CI 193 SC 193.7 P56 L33 # 30

Murty, Ramana

Broadcom

Comment Type ER Comment Status X

OMz fiber type is TBD

SuggestedRemedy

Replace "type TBD" with "type OMz". Both subclause 193.7 and footnote in Table 193-5. Add an editor's note that the fiber name will be added when available (one note in 193.7 should be adequate).

Proposed Response Response Status O

CI 193 SC 193.7 P56 L33 # 64

Bernier, Eric

Huawei

Comment Type TR Comment Status X

Last fibre Type is TBD

SuggestedRemedy

Update Type to OMz

Proposed Response Response Status O

CI 193 SC 193.7.1 P57 L26 # 35

Simms, William

NVIDIA

Comment Type TR Comment Status X

OMaouter (min) is undefined over part of its domain rather than merely unvalued. The row reads "for max (TECQ, TDECQ) <= 1.8 dB" and "for 1.8 < max (TECQ, TDECQ) <= TBD", and TDECQ (max) and TECQ (max) in the same table are TBD. With the upper breakpoint open, the piecewise definition has no stated behaviour above 1.8 dB, so a transmitter cannot be shown to comply. The same construction appears in Table 193-6 for receiver sensitivity (P58 L28-29). The same applies at CI 194 SC 194.7.1 P92 L25-30.

SuggestedRemedy

Set the upper breakpoint equal to max (TECQ, TDECQ) (max) by reference rather than as an independent number, so that closing TDECQ (max) and TECQ (max) closes this row as well and the two cannot drift apart.

Proposed Response Response Status O

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CI 193	SC 193.7.1	P57	L29	# 13
Ghiasi, Ali		Ghiasi Qunatum/Marvell		
Comment Type	TR	Comment Status	X	
TECQ and TDECQ are TBD				
SuggestedRemedy				
Propose to go with 4.0 dB for TECQ and TDECQ considering that the refeence equalizer has 15 tap FFE and 1T DFE which is much more powerfull than the 802.3db 9T FFE				
Proposed Response	Response Status O			

CI 193	SC 193.7.1	P57	L39	# 74
Dawe, Piers		Nvidia		
Comment Type	TR	Comment Status	X	
This transmitter transition time limit (9 ps) was scaled from 50G (34) then 100G (17) where a product receiver with FFE-based or other linear equalization was considered. It needs updating for the DFE, and considering the MMF channel. At 200G, transmitter bandwidth relative to the line rate is more challenging, and the optical channel bandwidth can be low in MMF, and receivers have DSP, with design learnings from copper where the signals are *much* slower, so they tolerate slow signals very well. There may be an indirect relationship between transition time -> (bandwidth and shape) -> group delay response -> difficult to equalise and error floor but the chain of correlations is too tenuous (if it weren't, we could not operate over the slow MMF channels that we can operate over). It would be strongly affected by filter shapes. However, this is a specification; we specify outcomes, not possible causes. A signal that the ECQ equaliser finds difficult to equalise, gets a bad rating anyway. Transmitter transition time is not very accurate because the two edges that are measured can be affected by ISI in the same was as was shown to make the old definition of OMA inaccurate. The relation between bandwidth and transition time is not 1:1. A transmitter implementer with poor (bandwidth and shape) can get a pass on transition time by cranking up the emphasis, which makes the signal worse but compliant. This spec item encourages bad behaviour. A slow signal (if it is a problem at all) is identified in a more realistic near best-fit way in ECQ; tap limits, the overshoot limit and the ECQ limit itself catch undesirable signals but in a more reasonable, balanced way. We don't need this leftover from the time of very short equalizers as well. Notice that for 800GBASE-LR4, the limit is 13 ps for a 7% faster line rate, and it's probably the same receiver DSP that tolerates this.				
SuggestedRemedy				
Preferably: Delete the row. Delete 193.9.12, Transmitter transition time. Delete the row in Table 193-13, Mapping of parameters to test patterns and related subclauses. If that is too bold at this stage, change the limit to 13 ps, same as for 800GBASE-LR4. Similarly in Clause 194.				
Proposed Response		Response Status O		

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CI 193 SC 193.7.1 P57 L39 # 34

Simms, William NVIDIA

Comment Type T Comment Status X

Transmitter transition time is defined as 9ps each lane max. This is different from 8ps (sometimes 13ps) which is used in dj. The expectation is that 17ps from 100Gbps links was halved to 8.5ps and rounded down to 8ps in dj and rounded up to 9ps here. I am proposing 10ps in dj to account for the additional impacts of DFE which were not considered in the derivation of the number.

SuggestedRemedy

change the value here to 10ps or note that this number may need to change. Same values shared with table 194-5 S194.7.1 P92 L38

Proposed Response Response Status O

CI 193 SC 193.7.1 P57 L50 # 46

Simms, William NVIDIA

Comment Type E Comment Status X

Footnote b of Table 193-5 reads "If measured into type A1a.2 or type A1a.3, or A1a.4, or TBD, 50 um fiber, in accordance with IEC 61280-1-4." The list is punctuated inconsistently, drops "type" before A1a.4, and embeds a bare TBD in a normative footnote. 193.6 at P56 L33 sets out the same list correctly as "type A1a.2 (OM3), type A1a.3 (OM4), type A1a.4 (OM5), or type TBD".

SuggestedRemedy

Restyle the footnote to match P56 L33, and carry the OMz fiber type through from whatever designation is settled for that fiber.

Proposed Response Response Status O

CI 193 SC 193.7.1 P59 L33 # 18

Ghiasi, Ali Ghiasi Qunatum/Marvell

Comment Type TR Comment Status X

transmitter overshoot/undershoot maximum need to be redcued given that we have 3 Preset

SuggestedRemedy

Reduce max overshoot/undershoot from 27% to 20% and see ghiasi_3ds_01_2609 for the table to be included in the 193.9.9 FA bandwidth for each of of the Presets

Proposed Response Response Status O

CI 193 SC 193.7.2 P58 L7 # 43

Simms, William NVIDIA

Comment Type ER Comment Status X

Table caption is misspelled: "Table 193-6—Receive charactersitics". The same misspelling appears in the Clause 194 caption. The same applies at CI 194 SC 194.7.2 P93 L6.

SuggestedRemedy

Change "charactersitics" to "characteristics" in both captions, and check the lists of tables.

Proposed Response Response Status O

CI 193 SC 193.7.2 P58 L29 # 17

Ghiasi, Ali Ghiasi Qunatum/Marvell

Comment Type TR Comment Status X

TECQ is TBD

SuggestedRemedy

Propose to go with 4.0 dB for TECQ and TDECQ considering that the refeence equalizer has 15 tap FFE and 1T DFE which is much more powerfull than the 802.3db 9T FFE

Proposed Response Response Status O

CI 193 SC 193.7.2 P58 L31 # 19

Ghiasi, Ali Ghiasi Qunatum/Marvell

Comment Type TR Comment Status X

Stressed receiver sensitivity (OMAouter) is TBD

SuggestedRemedy

-0.9 dBm

Proposed Response Response Status O

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CI 193 SC 193.7.2 P58 L35 # 20
 Ghiasi, Ali Ghiasi Qunatum/Marvell
 Comment Type TR Comment Status X
 SECQ is TBD
 SuggestedRemedy
 change to 4.0 dB
 Proposed Response Response Status O

CI 193 SC 193.7.3 P59 L16 # 41
 Simms, William NVIDIA
 Comment Type TR Comment Status X
 The illustrative link power budget is empty of the quantities that make it a budget: power budget, allocation for penalties, and additional insertion loss allowed are TBD for every fiber column in both clauses. Figure 193-3 and Figure 194-3 carry "[Editors' note: The figure will be updated after link budget is finalized.]" D1.1 comments 40, 43 and 44, which asked for OMAouter (min) and receiver sensitivity to be shown, were closed on the express promise that they would appear in these figures once the budget was final. Two drafts later that has not happened, and without it the transmit and receive tables cannot be checked for self-consistency. The same applies at CI 194 SC 194.7.3 P94 L15-20, and Figures 193-3 / 194-3.

SuggestedRemedy
 Publish the link budget, or state the gating item and the schedule for it. Until the budget exists the draft is not ready for Working Group ballot, and that should be recorded rather than left implicit in the TBDs.

Proposed Response Response Status O

CI 193 SC 193.7.3 P59 L34 # 21
 Ghiasi, Ali Ghiasi Qunatum/Marvell
 Comment Type TR Comment Status X
 Power budget for max TDECQ is TBD
 SuggestedRemedy
 Suggest to go with 1.6 dB connector loss + 4.0 dB TDECQ + 0.2 dB for modal noise= 6.0 dB
 Additional insertion loss = 0 dB
 Proposed Response Response Status O

CI 193 SC 193.7.3 P59 L36 # 22
 Ghiasi, Ali Ghiasi Qunatum/Marvell
 Comment Type TR Comment Status X
 Allocation for penalties for max TDECQ
 SuggestedRemedy
 4.0 dB + 0.2 dB for modal noise = 4.2 dB
 with zero dB allocated for additional insertion loss
 Proposed Response Response Status O

CI 193 SC 193.8 P61 L18 # 31
 Murty, Ramana Broadcom
 Comment Type T Comment Status X
 Cabling skew (max) and cabling skew variation (max) are TBD for OMz in Table 193-8. The values for OMz should be the same as OM3. OM4 and OM5, and consistent with the skew values at SP3 and SP4 in 193.4.2.
 SuggestedRemedy
 Set cabling skew (max) to 79 ns and cabling skew variation (max) to 2.4 ns for OMz fiber.
 Proposed Response Response Status O

CI 193 SC 193.8.3 P62 L7 # 54
 Dudek, Mike Marvell
 Comment Type E Comment Status X
 typo
 SuggestedRemedy
 Change "an" to "and"
 Proposed Response Response Status O

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CI 193 SC 193.8.3.5 P65 L44 # 55
Dudek, Mike Marvell
Comment Type E Comment Status X
Figure 193-9 shows an angled interface
SuggestedRemedy
Delete "with an angled end facet"
Proposed Response Response Status O

CI 193 SC 193.9 P65 L51 # 56
Dudek, Mike Marvell
Comment Type T Comment Status X
5m length is a significant percentage of the 30m reach. i.e. it is no longer really "short".
Particularly if the patch cord were OM3.
SuggestedRemedy
Change 5m to 3m here and in 193.5.1. Also in the PICS OM1 in both clause 193 and 194
amd 194.5.1 and 194.9
Proposed Response Response Status O

CI 193 SC 193.9.3 P67 L28 # 76
Dawe, Piers Nvidia
Comment Type TR Comment Status X
The choice of fourth-order Bessel-Thomson response is a historical accident. Fifth order
has a better phase response and rolls off a bit steeper at high frequencies, which is more
realistic. The better roll-off leads to better measurements. This is also true for
measurements where reflections at an instrument's electrical connectors are a concern.
Another filter with suitable phase response but steeper roll-off around 120 GHz would be
preferable, but has not yet been proposed. This is our chance to make a change, as the
industry transitions to a new speed and new test equipment.
SuggestedRemedy
Until a better proposal is made, change fourth-order to fifth-order throughout the draft.
In "1.3 x 106.25 GHz", reduce 1.3 to 1.25.
Add editor's note inviting a better proposal.
Similarly in Clause 194.
Proposed Response Response Status O

CI 193 SC 193.9.7 P68 L10 # 73
Dawe, Piers Nvidia
Comment Type TR Comment Status X
This says "TDECQ ... using the methods specified in 180.9.6, with the following
exceptions". 180.9.6 is messed up now. Among multiple issues, it allows a short-cut high
estimate of ECQ to be used for calibrating a receiver test, so the receiver is under-stressed
in the test.

SuggestedRemedy
Change the reference from 180.9.6 to 167.8.6, which is for multimode, and add the
exceptions to that; principally, the signaling rate and addition of the DFE.
Similarly in Clause 194.

Proposed Response Response Status O

CI 193 SC 193.9.7 P68 L25 # 77
Dawe, Piers Nvidia
Comment Type TR Comment Status X
We agreed on +/-2% threshold adjust but we did not appreciate that this should be 2% of
OMA_outer not OMA_TDECQ (because the DFE subtracts in ideally-spaced signal, leaving
all the error: it changes the denominator and not the numerator). With the stronger DFE
that MMF needs, the difference matters.

SuggestedRemedy
P802.3dj might correct this. If they don't, make exceptions here and in Clause 194.

Proposed Response Response Status O

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CI 193 SC 193.9.7.1 P69 L23 # 37

Simms, William

NVIDIA

Comment Type TR Comment Status X

Table 193-13 diverges from the corresponding table in IEEE P802.3dj D3.2 (Table 180-16) in two substantive respects, with no note explaining why: - the pre-post-cursor tap coefficient difference limit is written here as a signed pair, minimum -0.4 and maximum 0.25, where 802.3dj D3.2 writes it inside absolute value bars, $|w(1)/w(0) - b(1) - w(-1)/w(0)|$ with maximum 0.25 and no minimum; - the feedback tap coefficient limit $b(1)$ has a maximum of 0.67 here against 0.33 in 802.3dj D3.2. These interact. Because the difference limit contains $b(1)$, doubling the permitted $b(1)$ changes the reachable range of the limited quantity, and because the main tap minimum is $0.9 - b(1)$ in both drafts, $b(1)$ max of 0.67 lets the main tap fall to 0.23 here against 0.57 in 802.3dj. The reference equalizer is therefore materially stronger in this draft. The task force rejected D1.1 comments 107, 124 and 126 on the express grounds that P802.3ds should remain aligned with IEEE P802.3dj, so the divergence needs a stated reason. The same applies at CI 194 SC 194.9.7.1 P104 L23-24, L29.

SuggestedRemedy

State in 193.9.7.1 and 194.9.7.1 the basis for the signed limit of -0.4 and for the $b(1)$ maximum of 0.67, so that the reason this draft departs from 802.3dj is recorded. The signed form used here is the better of the two, and is the form used in IEEE Std 802.3dk-2026 168.7.5, so the departure should be settled by asking P802.3dj to align with this draft and not by changing this one. The $b(1)$ maximum is a separate question and is already flagged by the editor's note above the table.

Proposed Response Response Status O

CI 193 SC 193.9.7.1 P69 L26 # 45

Simms, William

NVIDIA

Comment Type ER Comment Status X

The DC gain row of Table 193-13 has a stray placeholder and has lost the distinction between the feed-forward and feedback taps. It reads "Equalizer DC gain" with footnote "The sum of all TBD equalizer coefficients, $w(i)$." The corresponding row of IEEE P802.3dj D3.2 Table 180-16 reads "Feed-forward tap DC gain" with footnote "The sum of all 15 feed-forward tap coefficients, $w(i)$." As written, "all equalizer coefficients" would include the feedback tap $b(1)$, which is not part of a DC gain sum and is referenced to a different quantity (OMATDECQ/2, per footnote b). The same applies at CI 194 SC 194.9.7.1 P104 L26, L30.

SuggestedRemedy

Change the row heading to "Feed-forward tap DC gain" and the footnote to "The sum of all 15 feed-forward tap coefficients, $w(i)$." in both tables.

Proposed Response Response Status O

CI 193 SC 193.9.7.1 P69 L30 # 32

Murty, Ramana

Broadcom

Comment Type T Comment Status X

The equalizer DC gain definition is TBD in Table 193-13. It is defined as the sum of all 15 feed-forward tap coefficients in P802.3dj.

SuggestedRemedy

Define the feed-forward tap DC gain as the sum of all 15 coefficients.
Replace "equalizer DC gain" with "feed-forward tap DC gain" to be consistent with P802.3dj. Same change in Table 194-13.

Proposed Response Response Status O

CI 193 SC 193.9.9 P69 L45 # 39

Simms, William

NVIDIA

Comment Type TR Comment Status X

Transmitter overshoot and undershoot (max) was given the value 27% in D1.2, and the editors' note immediately above the subclause says "Data supporting the limit on transmitter overshoot and undershoot is encouraged. Implementation of optical link training may impact the limit." A normative limit should not be introduced while the draft itself records that the supporting data is absent and that a known mechanism may change it. The same applies at CI 194 SC 194.9.9 P104 L40-41.

SuggestedRemedy

Provide the data on which 27% rests, or return the cell to TBD until it exists, so that reviewers are not asked to ballot a number the draft does not defend.

Proposed Response Response Status O

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CI 193 SC 193.9.10 P70 L6 # 38

Simms, William

NVIDIA

Comment Type TR Comment Status X

The transmitter power excursion limit and the method used to test it are stated at different hit ratios. The editors' note says "The transmitter power excursion limit was set with a hit ratio of 3×10^{-3} ", while the normative text four lines later says Pmax and Pmin "are defined by the methods in 140.7.7 using a 1×10^{-4} hit ratio". A limit derived at one hit ratio and enforced at another is not the limit that was agreed; 1×10^{-4} reaches further into the tails, so the 2.3 dBm value in Table 193-5 is being applied more severely than when it was set. The same applies at CI 194 SC 194.9.10 P105 L3-4, L15.

SuggestedRemedy

Either restate the limit at 1×10^{-4} , or set the method in 193.9.10 and 194.9.10 to 3×10^{-3} to match the basis of the limit. Say which was intended.

Proposed Response Response Status O

CI 193 SC 193.9.14 P70 L50 # 81

Dawe, Piers

Nvidia

Comment Type TR Comment Status X

193.9.14 does not say what is meant by sensitivity (although 193.9.2 does). We need to reference or include 193.2, 193.9.2, Table 180-19 Error ratio parameters, and Table 180-20 Receiver error mask -- from 193.9.14, and some of these from 193.2, 193.9.2 and 193.9.15 (which already mentions BLER, 193.2 and 193.9.2). However, Table 180-19 like 193.2 provides BERadded for only one scenario, while there are several.

SuggestedRemedy

Add cross-reference to 193.9.2, here and in 193.9.15, SRS.
In 193.9.14, add text stating that sensitivity can be measured at the PMA using the test method in either 174A.9.5, 174A.9.6, or 174A.9.7, or at the PCS using the method of 174A.11.
Incorporate Table 180-19, extended with each BERadded as a separate row or sub-row:
Errors counted at a detachable PMA that could be followed by AUI C2M and AUI C2C 6.4×10^{-5}
Errors counted at a detachable PMD/PMA that is followed by an AUI C2C 4×10^{-5}
Errors counted at a non-detachable PMA in the host 3.2×10^{-5}
Errors counted at the PCS in the host 3.2×10^{-5}
In 180.2, after "BERadded equal to 6.4×10^{-5} .", add "See Table 180-19 [or Clause 193 equivalent] for other scenarios."
Incorporate Table 180-20, e.g. by reference.
Add cross-references as needed.
Similarly in Clause 194.

Proposed Response Response Status O

CI 193 SC 193.9.15 P58 L31 # 42

Simms, William

NVIDIA

Comment Type T Comment Status X

Stressed receiver sensitivity (OMAouter) (max) and the stressed eye closure (SECQ) for the test are both TBD in both clauses, so the receiver's stressed conformance requirement does not exist yet. Separately, 193.9.15 carries "[Editors' note: Proposals have been made to replace the sinusoidal interferer. Presentations encouraged.]" It is not sound to fix SECQ and stressed sensitivity numbers while the stress that defines them is expected to change. The same applies at CI 194 SC 194.9.15 P93 L30, L34.

SuggestedRemedy

Settle the interferer before setting SECQ and stressed receiver sensitivity, so that the numbers are set against the test that will actually be used.

Proposed Response Response Status O

CI 193 SC 193.9.15 P71 L41 # 78

Dawe, Piers

Nvidia

Comment Type TR Comment Status X

The sinusoidal interferer in SRS is causing problems. It's a single frequency. The sampling scope aliases it to other frequencies and the software FFE will amplify it according to the apparent frequencies, not the real one, causing error. The sinusoidal interferer's frequency and its near dual-Dirac distribution are both highly untypical. Gaussian noise or QPRBS are preferable because both their spectra and probability distribution are more realistic. The rule that with the Gaussian noise generator on and the sinusoidal jitter and sinusoidal interferer turned off, the RIN17OMA of the SRS test source should be no greater than the RIN17OMA (max) specified for the transmit characteristics in Table 193-7 is not right, because some of the patterning (ISI) of the signal contributes to Gaussian tails.

SuggestedRemedy

1. Change from a sine tone to a PRBS13Q generator with a similar but not identical signalling rate to the pattern generator, low-pass filtered like the pattern generator signal.
2. Say that the SECQ of the PG and filter, with SI, SJ and GJ off, should be about 2.5 dB.
3. Change the rule about Gaussian noise: it should about 2 dB more than the product RIN limit.

Proposed Response Response Status O

P802.3ds D1.2 200 Gb/s per Wavelength MMF PHYs Task Force 3rd Task Force review comments

CI 194 SC 194.5.12 P90 L45 # 16
 Ghiasi, Ali Ghiasi Qunatum/Marvell
 Comment Type TR Comment Status X
 200G MMF can benefit enabling Presets in the O1 training format. Define O2 training frame in annex 178B to enable presets with different overshoot, power, and inner/outer eye adjustment
 SuggestedRemedy
 Need to define O2 training frame and replace O1 with O2, see ghiasi_3ds_01_2609
 Proposed Response Response Status O

CI 194 SC 194.7 P91 L19 # 33
 Simms, William NVIDIA
 Comment Type TR Comment Status X
 The medium is not defined. 194.7 states that a compliant PMD operates on "TBD/125 um multimode fibers", and Table 194-9 gives the nominal core diameter as TBD. A PMD clause cannot specify a Medium Dependent Interface against an undefined fiber. Dependent parameters are TBD for the same reason: encircled flux radii (Table 194-5, P92 L46-47), optical return loss tolerance (P92 L44), receiver reflectance (Table 194-6, P93 L24), and cabling skew and skew variation (Table 194-8, P96 L16-17). Clause 193 has closed all of these.
 SuggestedRemedy
 Identify the fiber type for the 1052-1068 nm PHYs, or record in the draft the external dependency and the expected date for it, so that reviewers can see which of the remaining TBDs are blocked by it.
 Proposed Response Response Status O

CI 194 SC 194.7.1 P92 L27 # 2
 Lewis, David Speciphy / Lumentum
 Comment Type T Comment Status X
 Based on lewis_3ds_01a_260826 we can replace some of the TBDs with values as presented.
 SuggestedRemedy
 In Table 194-5 TDECQ (max) and TECQ (max) replace TBDs with 4.4 dB
 Proposed Response Response Status O

CI 194 SC 194.7.1 P92 L28 # 24
 Ghiasi, Ali Ghiasi Qunatum/Marvell
 Comment Type TR Comment Status X
 TECQ and TDECQ are TBD
 SuggestedRemedy
 Propose to go with 4.0 dB for TECQ and TDECQ considering that the refeence equalizer has 15 tap FFE and 1T DFE which is much more powerfull than the 802.3db 9T FFE
 Proposed Response Response Status O

CI 194 SC 194.7.1 P92 L33 # 26
 Ghiasi, Ali Ghiasi Qunatum/Marvell
 Comment Type TR Comment Status X
 transmitter overshoo/undershoot maximum need to be redcued given that we have 3 Preset
 SuggestedRemedy
 Reduce max overhsoot/undershoot from 27% to 20% and see ghiasi_3ds_01_2609 for the table to be included in the 193.9.9 FA bandwidth for each of the Presets
 Proposed Response Response Status O

CI 194 SC 194.7.1 P92 L44 # 8
 Lewis, David Speciphy / Lumentum
 Comment Type T Comment Status X
 Based on lewis_3ds_01a_260826 we can replace some of the TBDs with values as presented.
 SuggestedRemedy
 In Table 194-5 Optical return loss tolerance replace "TBD" with "17"
 Proposed Response Response Status O

P802.3ds D1.2 200 Gb/s per Wavelength MMF PHYs Task Force 3rd Task Force review comments

CI 194 SC 194.7.1 P92 L49 # 47

Simms, William NVIDIA

Comment Type ER Comment Status X

Footnote b of Table 194-5 is an editors' note, "[Editors' note: Add IEC reference.]", standing in for the footnote text itself. The corresponding footnote in Table 193-5 gives IEC 61280-1-4 and the fiber types.

SuggestedRemedy

Supply the footnote, following the pattern of Table 193-5 footnote b.

Proposed Response Response Status O

CI 194 SC 194.7.2 P93 L24 # 9

Lewis, David Speciphy / Lumentum

Comment Type T Comment Status X

Based on lewis_3ds_01a_260826 we can replace some of the TBDs with values as presented.

SuggestedRemedy

In Table 194-6 Receiver reflectance (max) replace "TBD" with "-20"

Proposed Response Response Status O

CI 194 SC 194.7.2 P93 L28 # 3

Lewis, David Speciphy / Lumentum

Comment Type T Comment Status X

Based on lewis_3ds_01a_260826 we can replace some of the TBDs with values as presented.

SuggestedRemedy

In Table 194-6 Receiver sensitivity (OMAouter), each lane (max) replace "for 1.8 dB < TECQ <= TBD" with "for 1.8 dB < TECQ <= 4.4 dB"

Proposed Response Response Status O

CI 194 SC 194.7.2 P93 L28 # 25

Ghiasi, Ali Ghiasi Qunatum/Marvell

Comment Type TR Comment Status X

TECQ is TBD

SuggestedRemedy

Propose to go with 4.0 dB for TECQ and TDECQ considering that the refeence equalizer has 15 tap FFE and 1T DFE which is much more powerfull than the 802.3db 9T FFE

Proposed Response Response Status O

CI 194 SC 194.7.2 P93 L30 # 4

Lewis, David Speciphy / Lumentum

Comment Type T Comment Status X

Based on lewis_3ds_01a_260826 we can replace some of the TBDs with values as presented.

SuggestedRemedy

In Table 194-6 Stressed receiver sensitivity (max) replace "TBD" with "-0.7"

Proposed Response Response Status O

CI 194 SC 194.7.2 P93 L31 # 27

Ghiasi, Ali Ghiasi Qunatum/Marvell

Comment Type TR Comment Status X

Stressed receiver sensitivity (OMAouter) is TBD

SuggestedRemedy

-1.1 dBm

Proposed Response Response Status O

P802.3ds D1.2 200 Gb/s per Wavelength MMF PHYs Task Force 3rd Task Force review comments

CI 194 SC 194.7.2 P93 L33 # 5

Lewis, David Speciphy / Lumentum

Comment Type T Comment Status X

Based on lewis_3ds_01a_260826 we can replace some of the TBDs with values as presented.

SuggestedRemedy

In Table 194-6 SECQ for lane under test replace "TBD" with 4.4

Proposed Response Response Status O

CI 194 SC 194.7.2 P93 L35 # 28

Ghiasi, Ali Ghiasi Qunatum/Marvell

Comment Type TR Comment Status X

SECQ is TBD

SuggestedRemedy

change to 4.0 dB

Proposed Response Response Status O

CI 194 SC 194.7.3 P84 L15 # 7

Lewis, David Speciphy / Lumentum

Comment Type T Comment Status X

Based on lewis_3ds_01a_260826 we can replace some of the TBDs with values as presented.

SuggestedRemedy

In Table 194-7 Power budget (for max TDECQ) replace "TBD" with "6.3"

Proposed Response Response Status O

CI 194 SC 194.7.3 P94 L15 # 14

Ghiasi, Ali Ghiasi Qunatum/Marvell

Comment Type TR Comment Status X

Power budget for max TDECQ is TBD

SuggestedRemedy

Suggest to go with 1.6 dB connector loss + 4.0 dB TDECQ + 0.2 dB for modal noise= 6.0 dB
Additional insertion loss = 0 dB

Proposed Response Response Status O

CI 194 SC 194.7.3 P94 L20 # 15

Ghiasi, Ali Ghiasi Qunatum/Marvell

Comment Type TR Comment Status X

Allocation for penalties for max TDECQ

SuggestedRemedy

4.0 dB + 0.2 dB for modal noise = 4.2 dB
with zero dB allocated for additional insertion loss

Proposed Response Response Status O

CI 194 SC 194.7.3 P94 L20 # 6

Lewis, David Speciphy / Lumentum

Comment Type T Comment Status X

Based on lewis_3ds_01a_260826 we can replace some of the TBDs with values as presented.

SuggestedRemedy

In Table 194-7 Allocation for penalties (for max TDECQ) replace "TBD" with "4.6"

Proposed Response Response Status O

P802.3ds D1.2 200 Gb/s per Wavelength MMF PHYs Task Force 3rd Task Force review comments

CI 194 SC 194.8 P96 L16 # 10

Lewis, David Speciphy / Lumentum

Comment Type T Comment Status X

To match the required values already adopted in clause 193, we can put values for cable skew.

SuggestedRemedy

In Table 194-8: Cabling skew (max), replace "TBD" with "79"

Proposed Response Response Status O

CI 194 SC 194.8 P96 L18 # 11

Lewis, David Speciphy / Lumentum

Comment Type T Comment Status X

To match the required values already adopted in clause 193, we can put values for cable skew variation.

SuggestedRemedy

In Table 194-8: Cabling skew variation (max), replace "TBD" with "2.4"

Proposed Response Response Status O

CI 194 SC 194.8.1 P97 L12 # 12

Lewis, David Speciphy / Lumentum

Comment Type T Comment Status X

Fiber core diameter has been discussed in an offline consensus email group. The most common value mentioned is 26 um, although there is work going on to look at a few other diameters.

SuggestedRemedy

For now, in Table 194-9: Nominal core diameter, replace "TBD" with "26"

Proposed Response Response Status O

CI 194 SC 194.8.1 P97 L12 # 1

Ransford, Mike Corning

Comment Type TR Comment Status X

Nominal core diameter listed as "TBD"

SuggestedRemedy

Propose that we change this to 27 um +/- 2 um. There is still more testing to be done as it currently appears dependent on both the VCSEL and fiber suppliers. But this covers the originally discussed 25-26um range with some additional buffer that has merit.

Proposed Response Response Status O

CI 194 SC 194.9 P100 L49 # 48

Simms, William NVIDIA

Comment Type E Comment Status X

194.9 is still very largely a verbatim copy of 193.9. Table 194-13 is identical to Table 193-13 in every cell, including the stray TBD in footnote a and the editor's note above it. D1.1 comment 110 on this duplication was accepted in principle, with the response "Look for specific sections of 194.9 (and other subclauses) that could be removed in a future draft." D1.2 is three pages shorter overall, so little if any of that has happened, and the duplication is now actively harmful: the same defect has to be found and fixed twice, and the two copies can diverge silently.

SuggestedRemedy

Replace the duplicated subclauses of 194.9 with references to 193.9 plus a list of exceptions, starting with the reference equalizer, where the two clauses are identical and there is no reason for them to be stated twice.

Proposed Response Response Status O

CI 194 SC 194.9 P100 L51 # 57

Dudek, Mike Marvell

Comment Type T Comment Status X

With the reach on L1060-800 only being 10m a 5m patchcord of this grade of fiber would degrade measurements. (even if the length is limited to 3m per another comment)

SuggestedRemedy

change "short patch cable" to "short L1060_2200 or better patch cable"

Proposed Response Response Status O

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CI 194 SC 194.9.13 P105 L37 # 36

Simms, William

NVIDIA

Comment Type TR Comment Status X

Clause 194 specifies a normative RIN limit whose measurement condition is undefined. Table 194-5 gives "RINxOMA, each lane (max)" as -135 dB/Hz, and 194.9.13 says the measurement is made "with an applied optical return loss of x (TBD) dB". The limit is numerically identical to the RIN17OMA limit in Table 193-5, which is measured at the 17 dB optical return loss tolerance given in Table 193-5. A RIN figure is meaningful only against a stated return loss, so either the -135 dB/Hz value is carried over from Clause 193 and x is 17, or the value does not yet have a basis.

SuggestedRemedy

Set x = 17 in 194.9.13 and in the Table 194-5 row heading, and set optical return loss tolerance (max) in Table 194-5 to 17 dB, matching Clause 193. If the intent is a different return loss for the 1052-1068 nm PHYs, state it and requalify the -135 dB/Hz limit against it.

Proposed Response Response Status O

CI Table SC Table 193-5 P57 L27 # 63

Bernier, Eric

Huawei

Comment Type TR Comment Status X

The upper bound of max (TECQ, TDECQ) is set to TBD

SuggestedRemedy

Set the value of TDB to 4.6dB. Full text should read: "Outer Optical Modulation Amplitude (OMAouter), each lane (min)
for max (TECQ, TDECQ) ≤ 1.8 dB
for 1.8 < max (TECQ, TDECQ) ≤ 4.6dB"

Proposed Response Response Status O

CI Table SC Table 193-5 P57 L28 # 61

Bernier, Eric

Huawei

Comment Type TR Comment Status X

Transmitter and dispersion eye closure for PAM4 (TDECQ), each lane (max) is currently set to TBD

SuggestedRemedy

Update to 4.6dB as per bernier_3ds_01a_2601.pdf

Proposed Response Response Status O

CI Table SC Table 193-5 P57 L31 # 62

Bernier, Eric

Huawei

Comment Type TR Comment Status X

Transmitter eye closure for PAM4 (TECQ), each lane (max) is currently set to TDB

SuggestedRemedy

Update to 4.6dB in both column as per bernier_3ds_01a_2601.pdf

Proposed Response Response Status O

CI Table SC Table 193-5 P57 L50 # 65

Bernier, Eric

Huawei

Comment Type TR Comment Status X

Fiber type is TBD

SuggestedRemedy

Update Type to OMz

Proposed Response Response Status O

CI Table SC Table 193-6 P58 L31 # 68

Bernier, Eric

Huawei

Comment Type TR Comment Status X

Stressed receiver sensitivity (OMAouter), each lane (max) is set to TBD

SuggestedRemedy

Set to 3.5dB as per bernier_3ds_01_260507.pdf

Proposed Response Response Status O

P802.3ds D1.2 200 Gb/s per Wavelength MMF PHYs Task Force 3rd Task Force review comments

Cl Table	SC Table 193-6	P58	L35	#	66
Bernier, Eric		Huawei			
Comment Type	TR	Comment Status X			
Stressed eye closure for PAM4 (SECQ), lane under test is set to TBD					
SuggestedRemedy					
Update to 4.6dB as per bernier_3ds_01a_2601.pdf					
Proposed Response		Response Status O			

Cl Table	SC Table 193-6	P59	L22	#	69
Bernier, Eric		Huawei			
Comment Type	TR	Comment Status	X		
Additional insertion loss allowed is set to TBD					
SuggestedRemedy					
Set value to 0.1dB as per bernier_3ds_adhoc_01_260303					
Proposed Response		Response Status	O		

Cl Table	SC Table 193-6	P59	L22	#	70
Bernier, Eric		Huawei			
Comment Type	TR	Comment Status	X		
Additional insertion loss allowed is set to TBD					
SuggestedRemedy					
Set value to 0.1dB as per bernier_3ds_adhoc_01_260303					
Proposed Response		Response Status	O		

Cl Table	SC Table 193-6	P59	L29	# 67
Bernier, Eric		Huawei		
Comment Type	TR	Comment Status	X	
The upper bound of max (TECQ, TDECQ) is set to TBD				
SuggestedRemedy				
Set the value of TDB to 4.6dB. Full text should read: "Outer Optical Modulation Amplitude (OMAouter), each lane (min)				
for max (TECQ, TDECQ) ≤ 1.8 dB				
for 1.8 < max (TECQ, TDECQ) ≤ 4.6dB"				
Proposed Response		Response Status O		

Cl Table	SC Table 193–8	P61	L18	#	71
Bernier, Eric		Huawei			
Comment Type	TR	Comment Status X			
Cabling Skew (max) is set to TBD for the OMz case. The maximum cabling skew should be 79 ns for OMz, consistent with OM3, OM4, and OM5. Cabling skew is primarily determined by differential fiber path length and is not expected to depend materially on the multimode fiber category. There is therefore no apparent technical basis for specifying a different value for OMz.					
SuggestedRemedy					
Replace TBD with 79 ns for OMz Cabling Skew (max).					
Proposed Response		Response Status O			

CI Table	SC Table 193-8	P61	L20	# 72
Bernier, Eric		Huawei		
Comment Type	TR	Comment Status X		
Cabling Skew Variation (max) is set to TBD for the OMz case. OMz should use the same cabling skew variation limit as OM3, OM4, and OM5 to preserve the existing receiver deskew assumptions.				
SuggestedRemedy				
Replace TBD with 2.4 ns for Cabling Skew Variation (max)				
Proposed Response		Response Status O		