

P802.3ds D1.1 200 Gb/s per Wavelength MMF PHYs Task Force 2nd Task Force review comments

Cl 1 SC 1.4 P18 L14 # 47
 Simms, William NVIDIA
 Comment Type ER Comment Status X
 incorrect call out 1.6Gb/s
 SuggestedRemedy
 change Gb/s to Tb/s two places line 14 and line 18
 Proposed Response Response Status O

Cl 30 SC 30.5.1.1.2 P20 L15 # 49
 Simms, William NVIDIA
 Comment Type ER Comment Status X
 typo 200BASE-MR1 should be 200GBASE-MR1
 SuggestedRemedy
 change 200BASE-MR1 to 200GBASE-MR1. similar 200G needs to be edited for line 21 and 24
 Proposed Response Response Status O

Cl 1 SC 1.4 P18 L41 # 1
 Mi, Guangcan Huawei
 Comment Type ER Comment Status X
 "lanes" is not commonly used as the unit of fiber. previously in 1.6TBASE-MR8, this draft used "eight pairs of multimode fiber". and for 800GBASE-SR4-30 it used "lanes" of fiber. In dj, "over eight single-mode fibers in each direction" was used. In df, previous instances of "lanes of multimode fibers" for x00GBASE-SRn were updated to "over n multimode fibers in each direction". The language should be made consistent within this project.
 later on in P30 of this draft, all PMDs defined in this draft are referred to as "using 400GBASE-R encoding over two multimode fibers in each direction, with reach up to at least 50 m"
 SuggestedRemedy
 either all use " n pairs of multimode fiber" or all use " n multimode fibers in each direction". The latter one is preferred because it is consistent with the recent x00GBASE-SRn PMDs, and it is clear that this is duplex operation not bidi. There are multiple instances in this subclause.
 Proposed Response Response Status O

Cl 30 SC 30.5.1.1.2 P20 L30 # 2
 Mi, Guangcan Huawei
 Comment Type ER Comment Status X
 for 400GBASE-MR2, "400GBASE-R PCS/PMA over 2-lane multimode fiber PMD ". While, in 802.3df, 400GBASE-R PCS/PMA over 4 single-mode fibers in each direction □ PMD" and "800GBASE-R PCS/PMA over 8 multimode fibers in each direction □ PMD" were used. It is better make the language consistent.
 SuggestedRemedy
 related to my previous comment about SC1.4. The choice should be consistent. Use the language decided in the comment of SC 1.4. either " n pairs of multimode fiber" or all use " n multimode fibers in each direction". There are multiple instances in this subclause.
 Proposed Response Response Status O

Cl 1 SC 1.4.92ha P18 L15 # 48
 Simms, William NVIDIA
 Comment Type E Comment Status X
 checking the use of term eight pairs of multimode fiber vs eight lanes
 SuggestedRemedy
 change to lanes if necessary
 Proposed Response Response Status O

Cl 45 SC 45.2.1.60g.1 P28 L15 # 51
 Simms, William NVIDIA
 Comment Type ER Comment Status X
 typo 200GBASE-MR10
 SuggestedRemedy
 change to 200GBASE-MR1
 Proposed Response Response Status O

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Cl 45 SC 45.2.1.60g.2 P28 L19 # 52
 Simms, William NVIDIA
 Comment Type E Comment Status X
 heading 200GTBASE-SR1-50 does not match prose of 200GBASE-SR1-50. Typo?
 SuggestedRemedy
 change heading to 200GBASE-SR1-50
 Proposed Response Response Status O

Cl 116 SC 116.1.4 P32 L26 # 55
 Simms, William NVIDIA
 Comment Type ER Comment Status X
 Note under table 116-5a defines O=Optical. I think O=optional as on prior table
 SuggestedRemedy
 change O=Optional
 Proposed Response Response Status O

Cl 45 SC Table 45-58g P28 L7 # 50
 Simms, William NVIDIA
 Comment Type ER Comment Status X
 typo 200GTBASE-SR1-30
 SuggestedRemedy
 change to 200GBASE-SR1-30
 Proposed Response Response Status O

Cl 116 SC 116.2.5 P32 L38 # 3
 Mi, Guangcan Huawei
 Comment Type ER Comment Status X
 missing comma before and
 SuggestedRemedy
 add comma before "and"
 Proposed Response Response Status O

Cl 116 SC 116.1.2 P29 L17 # 53
 Simms, William NVIDIA
 Comment Type E Comment Status X
 double check the clause call for MDIs KR1/2 and CR1/2. This calls KR1 cls 179 and KR2
 cls 178 while CR1 is 178 and CR2 179
 SuggestedRemedy
 correct clause reference if necessary
 Proposed Response Response Status O

Cl 169 SC 169.1.4 P39 L19 # 56
 Simms, William NVIDIA
 Comment Type ER Comment Status X
 typo on 4th column entry 800MII
 SuggestedRemedy
 change to "800GMII Extender"
 Proposed Response Response Status O

Cl 116 SC 116.1.4 P31 L18 # 54
 Simms, William NVIDIA
 Comment Type ER Comment Status X
 Table 116-4a third column is titled 20GMII
 SuggestedRemedy
 change the typo to 200GMII
 Proposed Response Response Status O

Cl 169 SC 169-3ab P40 L16 # 57
 Simms, William NVIDIA
 Comment Type ER Comment Status X
 typo on 4th column entry 800MII
 SuggestedRemedy
 change to "800GMII Extender"
 Proposed Response Response Status O

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Cl 178B SC 178B.6 P878 L46 # 126
 Dawe, Piers Nvidia
 Comment Type TR Comment Status X
 Signal detect should gate RTS. RTS should not move to DATA mode if no light is coming in, whether or not a retimer has locked its clock to something. 178B is in the P802.3dj draft.
 SuggestedRemedy
 Until P802.3dj fixes this, add the correction in P802.3ds: add text that for an optical PMD or PMD/PMA, local_rts should not be set to true if signal detect indicates that there is no optical input.
 Proposed Response Response Status O

Cl 178B SC 178B.7 P879 L41 # 128
 Dawe, Piers Nvidia
 Comment Type TR Comment Status X
 This 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. 178B is in the P802.3dj draft.
 SuggestedRemedy
 I wonder if this 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 comes to a satisfactory understanding of such fault recovery, add material in P802.3ds to address the issue.
 Proposed Response Response Status O

Cl 178B SC 178B.7.2 P880 L1 # 127
 Dawe, Piers Nvidia
 Comment Type TR Comment Status X
 A receiving PMD or PMA should not claim all is well if no light is coming in. Obviously the PMD needs to transmit onto the line so the link can start, but this comment is about the receive side behaviour. 178B is in the P802.3dj draft.
 SuggestedRemedy
 Until P802.3dj fixes this, add the correction in P802.3ds: add text in 178B.7.2 and possibly in 178B.8.3 saying that if the lane-by-lane signal detect is 0, per-lane ISL should (recommended) not move to mission mode or stay there.
 Proposed Response Response Status O

Cl 193 SC 193.1 P47 L24 # 116
 Dawe, Piers Nvidia
 Comment Type ER Comment Status X
 Table 193-1 and Table 193-2, Physical Layer clauses associated with... are clones of each other, and they don't fit on a single page. Each really has three columns. The status (optional, required or conditional) is the same in each. But the presentation obscures the very high level of commonality. Also it is inaccurate: there is no "Clause 117--200 Gb/s RS" for example; Clause 117 is for both 200 Gb/s and 400 Gb/s operation, and 117 appears twice in each table. Really, we are indicating what is relevant in the clause, not which clause we mean, so the sort-of title / description should be in a separate column from the clause number.

SuggestedRemedy
 Present these two tables as a single table with four columns: Clause number, 200GBASE-SR1-30 and 200GBASE-SR1-50 (with the abbreviated ~titles from Table 193-1), 400GBASE-SR2-30 and 400GBASE-SR2-50 (with the abbreviated titles from Table 193-2), Status. Combine footnotes c and e from Table 193-1 and Table 193-2. Follow Table 167-2, not Table 122-1 which inefficiently interleaves rows from two tables.
 Proposed Response Response Status O

Cl 193 SC 193.1 P47 L48 # 118
 Dawe, Piers Nvidia
 Comment Type ER Comment Status X
 These tables of what makes up a particular Physical Layer are not so useful for teaching beginners because they leave out the elephant in the room: the PMD clause. Beginners don't read everything all at once: they have to start somewhere. I know we have omitted this before.
 SuggestedRemedy
 Add a row:
 | 193 | 200GBASE-SR1-30 and
 200GBASE-SR1-50 PMDs | 400GBASE-SR2-30 and
 400GBASE-SR2-50 PMDs | Required |
 So the table can stand by itself.
 And similarly for other similar tables.
 Proposed Response Response Status O

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CI 193 SC 193.1 P49 L6 # 117

Dawe, Piers Nvidia
 Comment Type ER Comment Status X

Table 193-3 and Table 193-4, Physical Layer clauses associated with... are not quite clones of each other, and they don't fit on a single page. Each really has three columns. The status (optional, required or conditional) is the same in each. But the presentation obscures the very high level of commonality and makes it hard to spot the differences (PCS and PMA). Also it is inaccurate: there is no "120F--800GAUI-8 C2C" for example; Annex 120F is for many MAC rates. Really, we are indicating what is relevant in the clause, not which clause we mean, so the sort-of title / description should be in a separate column from the clause number.

SuggestedRemedy

Present these two tables as a single table with four columns: Clause number, 800GBASE-SR4-30 and 800GBASE-SR4-50 (with the abbreviated ~titles from Table 193-3), 1.6TBASE-SR8-30 and 1.6TBASE-SR8-50 (with the abbreviated titles from Table 193-4), Status. There will be one more row than in Table 193-3.

Combine footnote d.

Follow Table 167-2, not Table 122-1 which inefficiently interleaves rows from two tables.

Proposed Response Response Status O

CI 193 SC 193.2 P51 L41 # 119

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:

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} .

Or,

Add this information in 193.9.14 (see another comment) and refer to it here.

Proposed Response Response Status O

CI 193 SC 193.2 P52 L41 # 120

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.

Proposed Response Response Status O

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CI 193 SC 193.4.1 P53 L18 # 4 [REDACTED]
 Mi, Guangcan Huawei
 Comment Type ER Comment Status X
 reference to 116.4 should be a real cross reference, within this document.
 SuggestedRemedy
 fix the cross reference.
 Proposed Response Response Status O

CI 193 SC 193.4.1 P53 L19 # 60 [REDACTED]
 Simms, William NVIDIA
 Comment Type ER Comment Status X
 duplicate 800GBASE-SR4-50
 SuggestedRemedy
 remove duplicate and replace with 800GBASE-SR4-30
 Proposed Response Response Status O

CI 193 SC 193.4.2.1 P53 L49 # 59 [REDACTED]
 Simms, William NVIDIA
 Comment Type ER Comment Status X
 duplicate 400GBASE-SR2-50
 SuggestedRemedy
 remove duplicate and replace with 400GBASE-SR2-30. similar instance on line 31
 Proposed Response Response Status O

CI 193 SC 193.4.2.1 P53 L49 # 5 [REDACTED]
 Mi, Guangcan Huawei
 Comment Type ER Comment Status X
 the first 400GBASE_SR2-50 is wrong.
 SuggestedRemedy
 change to 400GBASE-SR2-30
 Proposed Response Response Status O

CI 193 SC 193.5.1 P54 L48 # 104 [REDACTED]
 Dawe, Piers Nvidia
 Comment Type TR Comment Status X
 Sometimes this diagram is taken too literally leading to a belief that the 2 to 5 m patch cord and TP2 are part of a service link. They are not; optical cabling may include a variety of connectors (not the type used on test equipment), patch panels, and maybe optical switches, the length of any first patch cord is not regulated, and there may be no accessible TP2.
 SuggestedRemedy

As in P802.3dj, add text: While TP2 and the patch cord for transmitter measurements and tests are shown in Figure 193-2, they are not part of the medium. The transmit MDI is connected to the medium for use, or to the patch cord and TP2 transmitter measurements and tests.
 Proposed Response Response Status O

CI 193 SC 193.5.1 P55 L5 # 124 [REDACTED]
 Dawe, Piers Nvidia
 Comment Type TR Comment Status X
 This 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; the ILT/RTS functions will be asleep until signal detect reports that there is light coming in and it is worth waking up. A consideration of squelch shows that getting this right can be important. Optical signal detect protects the DSP from processing crosstalk (successfully or not) when there is no input, and it definitively keeps the receiver from getting confused if the light has disappeared and confusing those debugging the network. For these purposes it does not matter that SD is slow, nor that it doesn't identify a good signal; it unambiguously identifies a too-weak or absent optical signal. Every optical clause has had a meaningful SD for many generations. But there might be implementations where delivering the signal detect information to the right place in RTS is impractical.
 SuggestedRemedy

Show signal detect as a recommended input to "ILT/RTS functions".
 Proposed Response Response Status O

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CI 193 SC 193.5.1 P55 L26 # 6 [REDACTED]
 Mi, Guangcan Huawei
 Comment Type **TR** Comment Status **X**
 missing SL_i and DL_i in the figure, and notes SL_i is source lane_i, DL_i is destination lane_i, as in Table 180-2.
 SuggestedRemedy
 Proposed Response Response Status **O**

CI 193 SC 193.5.4 P56 L28 # 8 [REDACTED]
 Mi, Guangcan Huawei
 Comment Type **ER** Comment Status **X**
 802.3dj adopted modifications to Table 180-5 during D3.0 comment resolution. Table 193-5 needs to be updated accordingly
 SuggestedRemedy
 delete "for any lane" and "for all lanes"
 Proposed Response Response Status **O**

CI 193 SC 193.5.4 P56 L21 # 7 [REDACTED]
 Mi, Guangcan Huawei
 Comment Type **TR** Comment Status **X**
 the place holder reference 300.5 has not been updated
 SuggestedRemedy
 change it to 193.5
 Proposed Response Response Status **O**

CI 193 SC 193.5.5 P56 L49 # 9 [REDACTED]
 Mi, Guangcan Huawei
 Comment Type **ER** Comment Status **X**
 "signal detect" should not be capitalized in this sentence.
 SuggestedRemedy
 change to "signal detect"
 Proposed Response Response Status **O**

CI 193 SC 193.5.4 P56 L21 # 125 [REDACTED]
 Dawe, Piers Nvidia
 Comment Type **TR** Comment Status **X**
 D3.0 comment 436: global signal detect should gate RTS. It would be advisable for the lane-by-lane signal detect to gate ILT training (no light = nothing to train on): see another comment.
 SuggestedRemedy
 Add sentence that Global_PMD_signal_detect should (recommended) be used as an input to the RTS function of 178A.
 Proposed Response Response Status **O**

CI 193 SC 193.5.7 P57 L9 # 10 [REDACTED]
 Mi, Guangcan Huawei
 Comment Type **TR** Comment Status **X**
 the name of PMD_global_transmit_disable variable has been updated in 802.3dj. Align this draft with 802.3dj D3.1
 SuggestedRemedy
 refer to 802.3dj D3.1 180.5.7
 Proposed Response Response Status **O**

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CI 193 SC 193.5.8 P57 L41 # 11
 Mi, Guangcan Huawei
 Comment Type **TR** Comment Status **X**
 The method and definition of PMD lane by lane transmit disable function has been updated in 802.3dj. Align this draft with 802.3dj D3.1
 SuggestedRemedy
 refer to 802.3dj D3.1 180.5.8
 Proposed Response Response Status **O**

CI 193 SC 193.5.12 P57 L50 # 73
 Ghiasi, Ali Ghiasi Qunatum/Marvell
 Comment Type **TR** Comment Status **X**
 Add missing definition for local_pattern
 SuggestedRemedy
 Add: When tx_mode = local_pattern (see 178B.8.3.1) the PMD transmits PRBS31Q (see 176.7.4.2).
 Proposed Response Response Status **O**

CI 193 SC 193.5.12 P57 L45 # 81
 Ghiasi, Ali Ghiasi Qunatum/Marvell
 Comment Type **TR** Comment Status **X**
 Define O2 training frame in annex 178B to enable presets with different overshoot, power, and inner/outer eye adjustment
 SuggestedRemedy
 see ghiasi_3ds_01_2607
 Proposed Response Response Status **O**

CI 193 SC 193.5.12 P57 L51 # 12
 Mi, Guangcan Huawei
 Comment Type **TR** Comment Status **X**
 The method described in APSU function subclause has been updated in 802.3dj. Align this draft with 802.3dj D3.1. particularly about the local pattern path of the ILT function and state diagram.
 SuggestedRemedy
 delete the paragraph of "When mr_training_enable is false and tx_mode is local_pattern...."
 add "When tx_mode = local_pattern (see 178B.8.3.1) the PMD transmits PRBS31Q (see 176.7.4.2).
 Proposed Response Response Status **O**

CI 193 SC 193.5.12 P57 L45 # 80
 Ghiasi, Ali Ghiasi Qunatum/Marvell
 Comment Type **TR** Comment Status **X**
 200G MMF can benefit enabling Presets in the O1 training format
 SuggestedRemedy
 Need to define O2 training frame and replace O1 with O2
 Proposed Response Response Status **O**

CI 193 SC 193.5.12 P58 L44 # 107
 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. Transmitting particular patterns is a PMA function.
 SuggestedRemedy
 This should be fixed in P802.3dj, otherwise P802.3ds would need to write out an 802.3-compliant APSU.
 Proposed Response Response Status **O**

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Cl 193 SC 193.5.12 P93 L50 # 82
 Ghiasi, Ali Ghiasi Qunatum/Marvell
 Comment Type TR Comment Status X
 Add missing definition for local_pattern
 SuggestedRemedy
 Add: When tx_mode = local_pattern (see 178B.8.3.1) the PMD transmits PRBS31Q (see 176.7.4.2).
 Proposed Response Response Status O

Cl 193 SC 193.6 P58 L4 # 13
 Mi, Guangcan Huawei
 Comment Type TR Comment Status X
 lane assignment is indeed needed for PMDs in this subclause, because the use of ILT and APSU funciton.
 SuggestedRemedy
 align the method of lane assignment to that of 802.3dj D3.1 180.6, with appropriate update to PMD names and references.
 Proposed Response Response Status O

Cl 193 SC 193.7.1 P59 L27 # 74
 Ghiasi, Ali Ghiasi Qunatum/Marvell
 Comment Type TR Comment Status X
 Missing TECQ and TDECQ
 SuggestedRemedy
 Propose to go with 4.4 dB for TECQ and TDECQ but constrain the distortion by introducing TDECQ(k) with max limit of 3.4 dB, where
 $TDECQ(k) = TDECQ - 10 \cdot \log_{10}(Ceq)$
 Update Table 193-8 missing TECQ and TDECQ
 Proposed Response Response Status O

Cl 193 SC 193.7.1 P59 L28 # 129
 Dawe, Piers Nvidia
 Comment Type TR Comment Status X
 While a limit on OMA-T(D)ECQ, which is the net usable modulation amplitude, is useful, T(D)ECQ itself is not a useful thing to limit because the receiver can tolerate any amount as long as the eye at the decision circuit is OK. The bad spec encourages optimising ECQ at the expense of performance which is bad behaviour. The things that matter (at 4.56e-4) are the net useful modulation amplitude, and the residual penalty, $K = ECQ - dBo(Ceq)$, and the overshoot. See alloin_3dj_03_2605 for more on Ceq: the one "to be subtracted" is the one that was added to find ECQ. More simply, K is a simpler ECQ, with Ceq fixed at 1 throughout the calculation.

SuggestedRemedy
 Change "Transmitter and dispersion eye closure for PAM4 (TDECQ), each lane (max)" to "Transmitter and dispersion residual penalty (TDK), each lane (max)". Change "Transmitter eye closure for PAM4 (TDECQ), each lane (max) to "Transmitter residual penalty (TDK), each lane (max)".
 Proposed Response Response Status O

Cl 193 SC 193.7.1 P59 L33 # 75
 Ghiasi, Ali Ghiasi Qunatum/Marvell
 Comment Type TR Comment Status X
 transmitter overshoot is TBD
 SuggestedRemedy
 Maximum transmitter overshoot is 27% at a hit ratio of 1E-4
 Proposed Response Response Status O

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CI 193 SC 193.7.1 P59 L39 # 102

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. Today at 200G, transmitter bandwidth relative to the line rate is more challenging, and receivers have DSP, with design learnings from copper where the signals are *much* slower, so they tolerate slow signals well. There may be an indirect relationship between transition time -> (bandwidth and shape) -> group delay response -> difficult to equalise and error floor although 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 it relies on the definition of OMA, which is less reliable than we hoped. 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 by the taps in ECQ; tap limits and the overshoot limit 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

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.

Proposed Response Response Status O

CI 193 SC 193.7.2 P60 L31 # 76

Ghiasi, Ali Ghiasi Qunatum/Marvell
 Comment Type TR Comment Status X

Stressed receiver sensitivity (OMAouter) is TBD

SuggestedRemedy

-0.5 dBm

Proposed Response Response Status O

CI 193 SC 193.7.2 P60 L37 # 77

Ghiasi, Ali Ghiasi Qunatum/Marvell
 Comment Type TR Comment Status X

SECQ is TBD

SuggestedRemedy
 change to 4.4 dB

Proposed Response Response Status O

CI 193 SC 193.7.2 P60 L42 # 14

Mi, Guangcan Huawei
 Comment Type TR Comment Status X

The mandatory error ratio requirement is using BLER and is specified in 193.2. "Measured with conformance test signal at TP3 (see 193.9.14) for the BER specified in 174A.6." is not correct.

SuggestedRemedy

change to "":
 Measured with conformance test signal at TP3 (see 193.9.14) for the BLER specified in 193.2.

Proposed Response Response Status O

CI 193 SC 193.7.3 P61 L8 # 16

Mi, Guangcan Huawei
 Comment Type TR Comment Status X

footnote a, b, e, and f are using incorrect Table reference Table 300-11.

SuggestedRemedy

change to Table 193-11

Proposed Response Response Status O

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CI 193 SC 193.7.3 P61 L8 # 15
 Mi, Guangcan Huawei
 Comment Type TR Comment Status X
 Table 193-9 now looks bulky and difficult to read, especially with the two sets of foot note listed in sequence. It would be better to break it off into two tables.
 SuggestedRemedy
 Make two tables Table 193-9—Illustrative link power budget of xGBASE-SRn-30, Table 193-10 —Illustrative link power budget of xGBASE-SRn-50
 Proposed Response Response Status O

CI 193 SC 193.7.3 P61 L19 # 78
 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 + 4.4 dB TDECQ + 0.2 dB for modal noise= 6.2 dB
 Additional insertion loss = 0 dB
 Proposed Response Response Status O

CI 193 SC 193.7.3 P61 L16 # 64
 Murty, Ramana Broadcom
 Comment Type TR Comment Status X
 Fiber EMB is specified in both Table 193-9, Illustrative link power budget, and Table 193-11, Optical fiber and cable characteristics. The fiber EMB information belongs in Table 193-11.
 SuggestedRemedy
 Remove the rows associated with fiber EMB in Table 193-9, and the associated footnotes a,b,e and f.
 Proposed Response Response Status O

CI 193 SC 193.7.3 P61 L21 # 91
 Landry, Gary Coherent Corp.
 Comment Type TR Comment Status X
 Table 193-9 is missing operating distance for SRx-30 and OMz. Given the nomenclature suffix, this should be 30m.
 SuggestedRemedy
 In Table 193-9, change OMz SRx-30 operating distance from TBD to "0.5 to 30"
 Proposed Response Response Status O

CI 193 SC 193.7.3 P61 L16 # 65
 Murty, Ramana Broadcom
 Comment Type TR Comment Status X
 Footnotes are repeated in Table 193-9.
 SuggestedRemedy
 Remove footnotes e-h.
 Proposed Response Response Status O

CI 193 SC 193.7.3 P61 L42 # 79
 Ghiasi, Ali Ghiasi Qunatum/Marvell
 Comment Type TR Comment Status X
 Allocation for penalties for max TDECQ
 SuggestedRemedy
 4.4 dB + 0.2 dB for modal noise = 4.6 dB
 with zero dB allocated for additional insertion loss
 Proposed Response Response Status O

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CI 193 SC 193.8 P62 L37 # 17

Mi, Guangcan Huawei
 Comment Type TR Comment Status X

Another comment was submitted about the lane assignment in 193.6. If it is agreed that lane assignment should be specific to support operation of ILT, then the following sentence needs be deleted. "As defined in 193.8.3, the optical lanes appear in defined locations at the MDI but the locations are not assigned specific lane numbers within this standard because any transmitter lane may be connected to any receiver lane."

SuggestedRemedy

delete the sentence. "As defined in 193.8.3, the optical lanes appear in defined locations at the MDI but the locations are not assigned specific lane numbers within this standard because any transmitter lane may be connected to any receiver lane."

Proposed Response Response Status O

CI 193 SC 193.8 P63 L19 # 92

Landry, Gary Coherent Corp.
 Comment Type TR Comment Status X

Table 193-10 is missing operating distance for SRx-30 and OMz. Given the nomenclature suffix, this should be 30m.

SuggestedRemedy

In Table 193-10, change OMz SRx-30 operating distance from TBD to 30

Proposed Response Response Status O

CI 193 SC 193.8.1 P63 L36 # 61

Simms, William NVIDIA
 Comment Type E Comment Status X

duplicate call to Table 193-11 on line 36 and 38

SuggestedRemedy

likely one call is to Table 193-10

Proposed Response Response Status O

CI 193 SC 193.8.2 P64 L7 # 66

Murty, Ramana Broadcom
 Comment Type TR Comment Status X

The EMB for OM4, OM5 and OMz is specified at different wavelengths. Make this clear in Table 193-11.

SuggestedRemedy

In Table 193-11, remove the row on nominal fiber specification wavelength. Replace the row "Effective modal bandwidth at 860 nm (min)" with two rows: "Effective modal bandwidth at 852 nm (min)" and "Effective modal bandwidth at 868 nm (min)" with value of 5200 MHz.km for OMz in both rows. This will be illustrated with a short presentation.

Proposed Response Response Status O

CI 193 SC 193.8.3.1 P65 L1 # 18

Mi, Guangcan Huawei
 Comment Type TR Comment Status X

The optical lane assignment for the PMDs in this subclause need to be defined specifically so as to support 178B APSU and ILT function. The labels in figure193-5 and figure 193-6 needs be numbered.

SuggestedRemedy

update the method specified in 193.8.3.1 accordingly to show specific lane assignment at MDI, reference to 802.3dj D3.1 180.8.3 and 180A

Proposed Response Response Status O

CI 193 SC 193.8.3.1 P65 L14 # 95

Maki, Jeffery HPE
 Comment Type TR Comment Status X

Tx and Rx are not numbered as required by ILT/RTS.

SuggestedRemedy

Number the Tx and Rx in pairs following the approach of IEEE P802.3dj.

Proposed Response Response Status O

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CI 193 SC 193.8.3.1 P65 L31 # 96
 Maki, Jeffery HPE
 Comment Type TR Comment Status X
 Tx and Rx are not numbered as required by ILT/RTS.
 SuggestedRemedy
 Number the Tx and Rx in pairs following the approach of IEEE P802.3dj.
 Proposed Response Response Status O

CI 193 SC 193.8.3.2 P65 L40 # 19
 Mi, Guangcan Huawei
 Comment Type TR Comment Status X
 subclause need to be defined specifically so as to support 178B APSU and ILT function.
 The labels in figure193-7 needs be numbered.
 SuggestedRemedy
 update the method specified in 193.8.3.2 accordingly to show specific lane assignment at MDI, reference to 802.3dj D3.1 180.8.3 and 180A
 Proposed Response Response Status O

CI 193 SC 193.8.3.2 P66 L6 # 97
 Maki, Jeffery HPE
 Comment Type TR Comment Status X
 Tx and Rx are not numbered as required by ILT/RTS.
 SuggestedRemedy
 Number the Tx and Rx in pairs following the approach of IEEE P802.3dj.
 Proposed Response Response Status O

CI 193 SC 193.9.1 P68 L15 # 106
 Dawe, Piers Nvidia
 Comment Type TR Comment Status X
 Measuring OMA, and therefore extinction ratio, with pattern 4, PRBS13Q, is not accurate. In principle this point applies to RIN too, but in the that context, the inaccuracy probably doesn't matter.
 SuggestedRemedy
 If Pattern 4 is relegated to an approximate method (not normative) or deprecated for OMA and extinction ratio, remove it from the appropriate rows in this (normative) table or add a footnote to explain.
 Proposed Response Response Status O

CI 193 SC 193.9.1 P68 L22 # 20
 Mi, Guangcan Huawei
 Comment Type TR Comment Status X
 footnote a of Table 193-12, the references to 180.9.15 and 180.9.16 are not appropriate here. References should be made to the Receiver sensitivity and stressed receiver sensitivity in this subclause.
 SuggestedRemedy
 change the last two references in foot note a to 193.9.14 and 193.9.15
 Proposed Response Response Status O

CI 193 SC 193.9.1 P68 L44 # 21
 Mi, Guangcan Huawei
 Comment Type TR Comment Status X
 RINxxOMA are now changed to be RINxOMA.
 SuggestedRemedy
 change to RINxOMA. Or, since in this subclause, only x = 17 was used. Change to RIN_17_OMA may be more appropriate. RIN_17_OMA was also used in Table 193-7 transmit characteristics.
 Proposed Response Response Status O

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Cl 193 SC 193.9.2 P69 L69 # 121
 Dawe, Piers Nvidia
 Comment Type T Comment Status X
 Sensitivity is based on BLER now, not BER.
 SuggestedRemedy
 Change "at the BER specified in 174A.6" to "at the frame loss ratio specified in 174A.6, which is defined by BLER as described in 193.2, 174A.9 and 174A.11"
 Proposed Response Response Status O

Cl 193 SC 193.9.3 P69 L28 # 108
 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. This is our chance to make the change, as the industry transitions to a new speed and new test equipment.
 SuggestedRemedy
 Change fourth-order to fifth-order throughout the draft. In "1.3 x 106.25 GHz", reduce 1.3 to 1.25.
 Proposed Response Response Status O

Cl 193 SC 193.9.5 P69 L49 # 22
 Mi, Guangcan Huawei
 Comment Type TR Comment Status X
 the sentence is awkward "if measured as defined in 180.9.5"
 SuggestedRemedy
 change to "if measured using the method as defined in 180.9.5."
 Proposed Response Response Status O

Cl 193 SC 193.9.5 P69 L54 # 23
 Mi, Guangcan Huawei
 Comment Type TR Comment Status X
 193.9.3 defined reference receiver. The method specified in 193.9.7 should reference to 193.9.3, and not explicitly define reference receiver again. Multiple instances in page 69 and 70.
 SuggestedRemedy
 change "TDECQ is a measure of the optical transmitter vertical eye closure as measured through an optical to electrical converter (O/E) with a bandwidth equivalent to a combined reference receiver and worst case optical channel, and equalized with the reference equalizer specified in 193.9.7.1." to "TDECQ is a measure of the optical transmitter vertical eye closure as measured using a reference receiver as specified in 193.9.3, a worst case optical channel, and equalized with the reference equalizer specified in 193.9.7.1."
 Proposed Response Response Status O

Cl 193 SC 193.9.5 P69 L54 # 24
 Mi, Guangcan Huawei
 Comment Type TR Comment Status X
 In the exception of TDECQ methods, it says "The optical channel requirements in 180.9.6.2 do not apply. Instead, the optical splitter and variable reflector are adjusted so that each transmitter is tested with an optical return loss equal to the "optical return loss tolerance (max)" given in Table 193-7.". while at the beginning of this subclause, it states, "TDECQ is a measure of the optical transmitter vertical eye closure as measured through an optical to electrical converter (O/E) with a bandwidth equivalent to a combined reference receiver and worst case optical channel,...". It seems we are no longer defining and using a worst case channel in this subclause, instead we are only creating a max. optical return loss. The statement of worst case channel doesn't apply.
 SuggestedRemedy
 either define a worst case channel for this sub-clause, which consists of a patch cord with minimum loss, and splitter and variable optical attenuator to create the maximum optical return loss as given in Table 193-7.
 or rewrite the first sentence of the subclause, and delete the worst case channel.
 Proposed Response Response Status O

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CI 193 SC 193.9.5 P70 L12 # 26
 Mi, Guangcan Huawei
 Comment Type TR Comment Status X
 This exception needs be reconsidered. The statement means that the reference receiver (OE and oscilloscope) has frequency response of two cascaded filter, contradicts the definition in 193.3. It seems to be matching the conformance test setup figure 167-4, which together is very confusing. may need to update the conformance test block diagram.
 SuggestedRemedy
 a contribution will be provided with more details.
 Proposed Response Response Status O

CI 193 SC 193.9.5 P70 L19 # 25
 Mi, Guangcan Huawei
 Comment Type TR Comment Status X
 This exception is unnecessary, since Nf is the same as the Nf defined in 180.9.6
 SuggestedRemedy
 delet the exception about N(f)
 Proposed Response Response Status O

CI 193 SC 193.9.5 P70 L45 # 27
 Mi, Guangcan Huawei
 Comment Type TR Comment Status X
 This paragraph is no longer needed, since in 802.3dj D3.1, MMSE is implemented as the optimization method.
 SuggestedRemedy
 delete this paragraph. E32(line 45~49)
 Proposed Response Response Status O

CI 193 SC 193.9.6 P79 L49 # 123
 Dawe, Piers Nvidia
 Comment Type TR Comment Status X
 The definition of OMA in 180.9.5 leaves some loose ends:
 If the waveform is an inverted SSPRQ, does one use 7+ threes and 6+ zeros or 6+ threes and 7+ zeros?
 Why 6 and 7?
 The statistics of 7 vs. 7 or more could be better or worse; it depends on what's in SSPRQ. Other things being equal, excluding "or more" makes the analysis simpler (although no-one would do it by hand anyway). Similarly, does "central 2 UI" give better or worse consistency than 2.5 to 4.5 / 2 to 4? Starting at 2 is probably undesirable.
 We changed the definition because a measurement on just two runs is open to error caused by ISI, but measuring with PRBS13Q still has that problem. PRBS13Q is the reason why we say 7 and 6 not 7 and 7.

SuggestedRemedy
 Change the reference from 121.8.4 to 180.9.5.
 Change the text so that:
 The definition is with SSPRQ;
 Runs of 7, whether zeros or threes, except when using PRBS13Q;
 Users are warned that PRBS13Q (7 and 6 because that's what's available) is less accurate; in case of a conflict, SSPRQ takes precedence;
 Choose "runs of" vs. "or more" and central vs. 2.5 to 4.5 according to the evidence.
 Proposed Response Response Status O

CI 193 SC 193.9.7 P70 L17 # 67
 Murty, Ramana Broadcom
 Comment Type TR Comment Status X
 The second filter represents the reference receiver front end, not the reference equalizer front end.
 SuggestedRemedy
 Replace "reference equalizer front end" with "reference receiver front end".
 Proposed Response Response Status O

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CI 193 SC 193.9.7 P70 L24 # 109

Dawe, Piers Nvidia
 Comment Type TR Comment Status X

The threshold adjust rule (+/-2% of OMAouter) was based on a belief that OMA was accurately measured and representative (which might have been more true at 53 GbD than it is now at 106 GBd). It is based on a belief that the thresholds ought to be at 1/6, 1/2, 5/6 which isn't true, even in textbooks, for band-limited PAM4 and for some noise mechanisms, and the real receiver doesn't know or care about our concept of OMA. 2% is too restrictive and double jeopardy, because ECQ penalises unequal eyes correctly and proportionately without this rule. Transmitter implementers do not want to spend time and money tweaking for something that doesn't matter and is sometimes counter-productive, while real receivers are pretty tolerant and find their own thresholds well enough. It would be possible to write a more reasonable rule if there were a defined threat that ECQ doesn't already address (but I don't know of such a threat that this rule would be useful for): basing it on OMAouter is wrong, it "should" be OMA_TDECQ, but we have a better and more relevant estimate of the zero and three levels at the slicer which avoids the pitfalls of OMA estimation: the average of the samples in the histograms representing zeros and threes.

SuggestedRemedy

- 1a. Remove the threshold adjust rule
- 1b. If not, relax it to 2.5%
- 2a. Change "100%" from OMAouter to the difference between the means of the histogram samples associated with threes and zeros in the pattern
- 2b. If not, change from OMAouter to OMA_TDECQ
3. By the way, there is nothing "T" or "D" about OMA_TDECQ; it's the result of a measurement procedure that can be applied to any signal based on SSPRQ, so it should be named OMA_ECQ.

Proposed Response Response Status O

CI 193 SC 193.9.7 P70 L37 # 62

Simms, William NVIDIA
 Comment Type E Comment Status X

it appears PMD types 800GBASE and 400GBASE are in swapped positions

SuggestedRemedy

correct to 400GBASE-SR2-30 and 800GBASE-SR4-30

Proposed Response Response Status O

CI 193 SC 193.9.7 P71 L6 # 101

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.

Proposed Response Response Status O

CI 193 SC 193.9.7.1 P70 L51 # 28

Mi, Guangcan Huawei
 Comment Type TR Comment Status X

The definition of the reference equalizer and its reference model has been updated substantially in 802.3dj D3.1. need to align with it.

SuggestedRemedy

may be better to specified as reference to 180.9.6.3, with exception to the tap coefficient limit table.

Proposed Response Response Status O

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CI 193 SC 193.9.7.1 P71 L16 # 111

Dawe, Piers Nvidia

Comment Type TR Comment Status X

Transmitted SMF signals should not be over-emphasised, so the main tap should not be < approx 1, if there were no DFE tap. The minimum used to be 0.9 (one can think of that as 10% tolerance): it was changed to 0.8 when the DFE tap was added, because *under*-emphasised signals benefit from the DFE which affects the first FFE which affects the main tap. However, over-emphasised signals use little DFE, so 0.8 allows an excessively over-emphasised signal. Long story short: a much more accurate criterion is main tap + feedback tap < limit (in the same way as the formula for pre-post-cursor tap coefficient difference limit contains the feedback tap). Relative to the signalling rate, 200G silicon is slower than 100G or 50G silicon, and 200G receivers are designed to cope well with slow signals. Designing them to cope with badly set-up signals as well would be wasteful. The overshoot spec has allowances for other effects and is not tight enough to police over-emphasis well.

SuggestedRemedy

Change 0.8 to: 0.9 - b(1).

Proposed Response Response Status O

CI 193 SC 193.9.7.1 P71 L18 # 112

Dawe, Piers Nvidia

Comment Type TR Comment Status X

The tap weights were created by drawing limit lines that passed a population of SMF transmitters, some time ago. The main tap maximum and the other FFE tap limits need review, taking the DFE into account and considering what is cost-effective for receivers. In particular, we will see less of the characteristic alternating FFE tap weights because the DFE can do that job better, so taps 3+ should be tightened up. There effect of the varied MMF responses should be considered also.

SuggestedRemedy

Review the tap weight limits and make changes as appropriate.

Proposed Response Response Status O

CI 193 SC 193.9.7.1 P71 L27 # 113

Dawe, Piers Nvidia

Comment Type TR Comment Status X

Causal vs. anticausal pulse shapes
This pre-post equalizer coefficient difference limit $|w(1)/w(0) - b(1) - w(-1)/w(0)|$ seeks to keep the attack and decay of the signal pulse similar. Yet the evidence from https://iee802.org/3/dj/public/25_05/chayeb_3dj_01_2505.pdf#page=8 and 9, plotted in https://iee802.org/3/ds/public/Interim_May_27-28-2026/dawe_3ds_01_260527.pdf, shows that for a real receiver, the situation is far from symmetrical; relatively fast attack (c(-1) close to zero) and slow decay (c(+1) strongly -ve) is tolerated well, but the opposite is not. Note that some acceptable signals on chayeb page 9 remembering are off the bottom of the plot in dawe_3ds_01_260527.

SuggestedRemedy

Remove the absolute bars | |, and replace the dash in the minimum column with -0.4, so that the allowed range becomes -0.4 to +0.25. If necessary, state that this row is a constraint, just like the other tap limits (if there is a solution that fails this rule, and there is another solution that passes all the rules, that's a pass). But don't try to write out a constrained optimiser in the draft; it could be quite complicated and it's T&M implementation that should not appear in a standard anyway.

Proposed Response Response Status O

CI 193 SC 193.9.9 P72 L2 # 114

Dawe, Piers Nvidia

Comment Type TR Comment Status X

In P802.3dj, the hit ratio for overshoot and similar to 1e-4. However, that means that the result depends on the second worst zero and second worst three in SSPRQ, which is not good statistics.

SuggestedRemedy

Change 1e-4 to 5e-4, here and in 193.9.10 Transmitter power excursion

Proposed Response Response Status O

P802.3ds D1.1 200 Gb/s per Wavelength MMF PHYs Task Force 2nd Task Force review comments

CI 193 SC 193.9.12 P72 L33 # 30
 Mi, Guangcan Huawei
 Comment Type TR Comment Status X
 "measured through the reference receiver " is some what unambiguous.
 SuggestedRemedy
 delete "as measured through the reference receiver in 193.9.3"
 Add "The transmitter transition time is measured using waveforms captured at the output of the reference receiver defined in 193.9.3."
 Proposed Response Response Status O

CI 193 SC 193.9.12 P72 L36 # 29
 Mi, Guangcan Huawei
 Comment Type TR Comment Status X
 squarewave is no longer used as test pattern for any test in this subclause. Delete the excetpion.
 SuggestedRemedy
 delete "with the exception that the square wave test pattern may be used."
 Proposed Response Response Status O

CI 193 SC 193.9.13 P72 L46 # 68
 Murty, Ramana Broadcom
 Comment Type TR Comment Status X
 Incorrect reference for RIN_OMA calculation.
 SuggestedRemedy
 Replace 180.9.14 with 180.9.13.
 Proposed Response Response Status O

CI 193 SC 193.9.14 P72 L2 # 32
 Mi, Guangcan Huawei
 Comment Type TR Comment Status X
 there is no need to list out the names of the PMDs, instead reference to table 193-7 is sufficient.
 SuggestedRemedy
 change to "The conformance test signal at TP3 meets the requirements for a transmitter as specified in Table 180-7 followed by an attenuator."
 Proposed Response Response Status O

CI 193 SC 193.9.14 P72 L49 # 31
 Mi, Guangcan Huawei
 Comment Type TR Comment Status X
 The receiver sensitivity method references 193.2 and 193.9.2. However, 193.2 is error ratio requirement based on the BLER method, while 193.9.2 is described in the context of BER measurement. 193.9.2 provide some guidance on how to configure and understand a multi-lane PMD while the parameter is defined for each lane. However, it didn't provide any specific information on the methodology of determining the rx sensitivity or the BLER. Therefore, the rx sensitivity method as it stands now in 193.9.14 is not complete. Based on the discussion in 802.3dj, there is consensus on using block error histogram as the more practical method and the histogram mask was provided. An extrapolation method was provided in 180.9.14 to provide some guidance on how to reliably reduce test time, sothat standard can be put into practice. This method is clearly missed out in this subclause and need to be added.
 SuggestedRemedy
 update the method definition in 193.9.14 to include the block error histogram method in PMA, and note on extrapolation. A contribution is planned with further details.
 Proposed Response Response Status O

P802.3ds D1.1 200 Gb/s per Wavelength MMF PHYs Task Force 2nd Task Force review comments

Cl 193 SC 193.9.14 P72 L49 # 33
 Mi, Guangcan Huawei
 Comment Type T Comment Status X
 precoding configuration is not considered for receiver sensitivity.
 SuggestedRemedy
 add "Precoding (see 176.7.1.2) is enabled if the receiver requests precoding using the ILT function."
 Proposed Response Response Status O

Cl 193 SC 193.9.14 P73 L9 # 34
 Mi, Guangcan Huawei
 Comment Type T Comment Status X
 precoding configuration is not considered for stressed receiver sensitivity.
 SuggestedRemedy
 add "Precoding (see 176.7.1.2) is enabled if the receiver requests precoding using the ILT function."
 Proposed Response Response Status O

Cl 193 SC 193.9.14 P492 L5 # 122
 Dawe, Piers Nvidia
 Comment Type TR Comment Status X
 193.9.14 does not say what is meant by sensitivity, 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

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 6.4e-5
 Errors counted at a detachable PMD/PMA that is followed by an AUI C2C 4 x 10^-5
 Errors counted at a non-detachable PMA in the host 3.2 x 10^-5
 Errors counted at the PCS in the host 3.2 x 10^-5
 In 180.2, after "BERadded equal to 6.4 x 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.
 Proposed Response Response Status O

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Cl 193 SC 193.9.15 P73 L20 # 115

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 some other frequency and the software FFE will amplify it according to the apparent frequency, not the real one, causing error. The sinusoidal interferer's frequency and its near dual-Dirac distribution are both highly untypical. Gaussian noise or PRBS preferable because both their spectra and probability distribution (if PAM4) 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 PRBS generator (not synchronous to the victim, e.g. different length to SSPRQ) with a high enough signalling rate that wherever the aliasing takes the apparent frequencies to (there are many real frequencies in a PRBS), the overall enhancement will be reasonably consistent. A PAM2 PRBS is more "bounded-like" than a PAM4 one, but it has a uniform spectrum.
2. Limit the amount of bounded interference (e.g. pk-pk max 1/15 of OMAouter)
3. Change the rule about Gaussian noise: it should be more than RIN, not less.
4. In 121.8.10.1, we say "care should be taken to avoid harmonic relationships between the sinusoidal interferer, the sinusoidal jitter, the signaling rate, and the pattern repetition rate". After taking advice from scope experts: add the sampling rate of the scope to that list.

Proposed Response Response Status O

Cl 193 SC Table 193-3 P49 L5 # 58

Simms, William NVIDIA
 Comment Type ER Comment Status X

typo in table 193-3 first row, 1.6TBase....

SuggestedRemedy

should change to 800TBASE to align with other column

Proposed Response Response Status O

Cl 194 SC 194 P83 L1 # 105

Dawe, Piers Nvidia
 Comment Type TR Comment Status X

Many comments against 193 apply to 194, and possibly vice versa

SuggestedRemedy

Apply the resolutions to both clauses as appropriate

Proposed Response Response Status O

Cl 194 SC 194.1 P83 L9 # 69

Murty, Ramana Broadcom
 Comment Type ER Comment Status X

Missing "and".

SuggestedRemedy

"... 800GBASE-MR4, and 1.6TBASE-MR8 PMDs ..."

Proposed Response Response Status O

Cl 194 SC 194.1 P83 L18 # 35

Lewis, David Speciphy / Lumentum
 Comment Type TR Comment Status X

Table 194-1 should reference 200GBASE-MR1 throughout.

SuggestedRemedy

Replace "200GBASE-SR1-30 and 200GBASE-SR1-50" with "200GBASE-MR1" in the heading for the 2nd column and in footnotes c and d.

Proposed Response Response Status O

Cl 194 SC 194.1 P83 L19 # 70

Murty, Ramana Broadcom
 Comment Type ER Comment Status X

PMD names are incorrect in Tables 194-1 through 194-4.

SuggestedRemedy

Use correct PMD names.

Proposed Response Response Status O

P802.3ds D1.1 200 Gb/s per Wavelength MMF PHYs Task Force 2nd Task Force review comments

Cl 194 SC 194.1 P84 L3 # 36
 Lewis, David Speciphy / Lumentum
 Comment Type TR Comment Status X
 Table 194-2 should reference 400GBASE-MR2 throughout.
 SuggestedRemedy
 Replace "400GBASE-SR1-30 and 400GBASE-SR1-50" with "400GBASE-MR2" in the heading for the 2nd column and in footnotes c and d.
 Proposed Response Response Status O

Cl 194 SC 194.4.2.1 P89 L25 # 39
 Lewis, David Speciphy / Lumentum
 Comment Type TR Comment Status X
 Heading included "200GBASE-MR1-30"
 SuggestedRemedy
 Change "200GBASE-MR1-30" to "200GBASE-MR1"
 Proposed Response Response Status O

Cl 194 SC 194.1 P85 L3 # 37
 Lewis, David Speciphy / Lumentum
 Comment Type TR Comment Status X
 Table 194-3 should reference 800GBASE-MR4 throughout.
 SuggestedRemedy
 Replace "1.6TGBASE-SR8-30 and 1.6TGBASE-SR8-50" with "800GBASE-MR4" in the heading for the 2nd column. Replace "800GBASE-SR4-30 or 800GBASE-SR4-50" with "800GBASE-MR4" in footnote a.
 Proposed Response Response Status O

Cl 194 SC 194.5.12 P93 L45 # 89
 Ghiasi, Ali Ghiasi Qunatum/Marvell
 Comment Type TR Comment Status X
 200G MMF can benefit enabling Presets in the O1 training format
 SuggestedRemedy
 Need to define O2 training frame and replace O1 with O2
 Proposed Response Response Status O

Cl 194 SC 194.1 P86 L3 # 38
 Lewis, David Speciphy / Lumentum
 Comment Type TR Comment Status X
 Table 194-4 should reference 1.6TGBASE-MR8 throughout.
 SuggestedRemedy
 Replace "1.6TGBASE-SR8-30 and 1.6TGBASE-SR8-50" with "1.6TGBASE-MR8" in the heading for the 2nd column. Replace "1.6TGBASE-SR8-30 or 1.6TGBASE-SR8-50" with "1.6TGBASE-MR8" in footnote a.
 Proposed Response Response Status O

Cl 194 SC 194.5.12 P93 L45 # 90
 Ghiasi, Ali Ghiasi Qunatum/Marvell
 Comment Type TR Comment Status X
 Define O2 training frame in annex 178B to enable presets with different overshoot, power, and inner/outer eye adjustment
 SuggestedRemedy
 see ghiasi_3ds_01_2607
 Proposed Response Response Status O

P802.3ds D1.1 200 Gb/s per Wavelength MMF PHYs Task Force 2nd Task Force review comments

CI 194 SC 194.7 P98 L3 # 40
 Lewis, David Speciphy / Lumentum
 Comment Type TR Comment Status X
 Figure 194-3 does not show OMA (min).
 SuggestedRemedy
 Need a separate figure at the end of 194.7.1 showing OMA max and OMA min versus TDECQ.
 Proposed Response Response Status O

CI 194 SC 194.7.1 P95 L27 # 83
 Ghiasi, Ali Ghiasi Qunatum/Marvell
 Comment Type TR Comment Status X
 Missing TECQ and TDECQ
 SuggestedRemedy
 Propose to go with 4.4 dB for TECQ and TDECQ but constrain the distortion by introducing TDECQ(k) with max limit of 3.4 dB, where TDECQ(k)=TDECQ -10.log10(Ceq)
 Update Table 193-8 missing TECQ and TDECQ
 Proposed Response Response Status O

CI 194 SC 194.7.1 P95 L21 # 93
 Landry, Gary Coherent Corp.
 Comment Type TR Comment Status X
 Using supporting presentation bernier_3ds_01_2605.pdf, D1.1 changed OMA(max) from 3.8 to 3.5 dBm to align with AOP (max) at a given ER in Table 193-7. The argument for Tables in clause 194 are the same and should be updated.
 SuggestedRemedy
 In Table 194-7, change OMA (max) from 3.5 dBm to 3.8 dBm.
 Proposed Response Response Status O

CI 194 SC 194.7.1 P95 L33 # 84
 Ghiasi, Ali Ghiasi Qunatum/Marvell
 Comment Type TR Comment Status X
 transmitter overshoot is TBD
 SuggestedRemedy
 Maximum transmitter overshoot is 27% at a hit ratio of 1E-4
 Proposed Response Response Status O

CI 194 SC 194.7.1 P95 L21 # 131
 Rodes, Roberto Coherent
 Comment Type T Comment Status X
 OMA outer was updated in Draft 1.1 for Clause 193, but the change was not implemented in Clause 194. Align the parameter in Clause 194. Adjust receiver OMAouter specs accordantly
 SuggestedRemedy
 Change OMAuter max value from 3.5 to 3.8 in Tx and Rx characteristics tables
 Proposed Response Response Status O

CI 194 SC 194.7.1 P95 L42 # 103
 Dawe, Piers Nvidia
 Comment Type E Comment Status X
 RINxxOMA should be RINxOMA as in the base standard if the optical return loss tolerance x is not known, but if it is (as in 193.7.1), that number should be used.
 SuggestedRemedy
 Change RINxxOMA to RINxOMA, RIN17OMA or as appropriate (9 places in the draft).
 Proposed Response Response Status O

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Cl 194 SC 194.7.2 P96 L19 # 41
 Lewis, David Speciphy / Lumentum
 Comment Type TR Comment Status X
 Average receive power (min) should be Tx average power min - channel insertion loss, or -3.4 -1.7 = -5.1 dBm
 SuggestedRemedy
 Change value from -5 to -5.1 for Average receive power, each lane (min) in Table 194-8.
 Proposed Response Response Status O

Cl 194 SC 194.7.2 P96 L31 # 85
 Ghiasi, Ali Ghiasi Qunatum/Marvell
 Comment Type TR Comment Status X
 Stressed receiver sensitivity (OMAouter) is TBD
 SuggestedRemedy
 -0.6 dBm
 Proposed Response Response Status O

Cl 194 SC 194.7.2 P96 L22 # 94
 Landry, Gary Coherent Corp.
 Comment Type TR Comment Status X
 Using supporting presentation bernier_3ds_01_2605.pdf, D1.1 changed OMA(max) from 3.8 to 3.5 dBm to align with AOP (max) at a given ER in Table 193-7. The argument for Tables in clause 194 are the same and should be updated.
 SuggestedRemedy
 In Table 194-8, change OMA (max) and OMA_outer of each agressor lane from 3.5 dBm to 3.8 dBm
 Proposed Response Response Status O

Cl 194 SC 194.7.2 P96 L34 # 86
 Ghiasi, Ali Ghiasi Qunatum/Marvell
 Comment Type TR Comment Status X
 SECQ is TBD
 SuggestedRemedy
 change to 4.4 dB
 Proposed Response Response Status O

Cl 194 SC 194.7.2 P96 L28 # 42
 Lewis, David Speciphy / Lumentum
 Comment Type TR Comment Status X
 The breakpoint for receiver sensitivity should match the one for Tx OMA (min), i.e. a TDECQ value of 1.8 dB.
 SuggestedRemedy
 change "for TECQ <= TBD" to "for TECQ <= 1.8"
 change "for TBD < TECQ <= TBD" for "for 1.8 < TECQ <= TBD"
 Proposed Response Response Status O

Cl 194 SC 194.7.2 P97 L45 # 43
 Lewis, David Speciphy / Lumentum
 Comment Type TR Comment Status X
 This sentence says "receiver sensitivity (OMAouter) (max)" in the table...is illustrated in Figure 194-3. But a separate figure is needed in this section.
 SuggestedRemedy
 Need a separate figure at the end of 194.7.2 showing Receiver sensitivity (OMAouter), each lane (max) versus TECQ.
 Proposed Response Response Status O

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CI 194 SC 194.7.3 P97 L15 # 71
 Murty, Ramana Broadcom
 Comment Type **TR** Comment Status **X**
 Fiber EMB is specified in both Table 194-9, Illustrative link power budget, and Table 194-11, Optical fiber and cable characteristics. The fiber EMB information belongs in Table 194-11.
 SuggestedRemedy
 Remove the rows associated with fiber EMB in Table 194-9, and the associated footnote a.
 Proposed Response Response Status **O**

CI 194 SC 194.7.3 P97 L19 # 87
 Ghiasi, Ali Ghiasi Qunatum/Marvell
 Comment Type **TR** Comment Status **X**
 Power budget for max TDECQ is TBD
 SuggestedRemedy
 Suggest to go with 1.7 dB connector loss + 4.4 dB TDECQ + 0.2 dB for modal noise= 6.3 dB
 Additional insertion loss = 0 dB
 Proposed Response Response Status **O**

CI 194 SC 194.7.3 P97 L21 # 88
 Ghiasi, Ali Ghiasi Qunatum/Marvell
 Comment Type **TR** Comment Status **X**
 Allocation for penalties for max TDECQ
 SuggestedRemedy
 4.4 dB + 0.2 dB for modal noise = 4.6 dB
 with zero dB allocated for additional insertion loss
 Proposed Response Response Status **O**

CI 194 SC 194.7.3 P98 L3 # 44
 Lewis, David Speciphy / Lumentum
 Comment Type **TR** Comment Status **X**
 The text says that the Figure 194-3 shows transmitter OMAouter(min) but it's not there.
 SuggestedRemedy
 Add transmitter OMAouter(min) line to Figure 194-3
 Proposed Response Response Status **O**

CI 194 SC 194.8.1 P100 L15 # 45
 Lewis, David Speciphy / Lumentum
 Comment Type **TR** Comment Status **X**
 Effective modal bandwidth should be at 1060 nm.
 SuggestedRemedy
 Change 850 nm to 1060 nm.
 Proposed Response Response Status **O**

CI 194 SC 194.8.3.1 P101 L13 # 98
 Maki, Jeffery HPE
 Comment Type **TR** Comment Status **X**
 Tx and Rx are not numbered as required by ILT/RTS.
 SuggestedRemedy
 Number the Tx and Rx in pairs following the approach of IEEE P802.3dj.
 Proposed Response Response Status **O**

CI 194 SC 194.8.3.1 P101 L30 # 99
 Maki, Jeffery HPE
 Comment Type **TR** Comment Status **X**
 Tx and Rx are not numbered as required by ILT/RTS.
 SuggestedRemedy
 Number the Tx and Rx in pairs following the approach of IEEE P802.3dj.
 Proposed Response Response Status **O**

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Cl 194 SC 194.8.3.2 P102 L8 # 100
 Maki, Jeffery HPE
 Comment Type TR Comment Status X
 Tx and Rx are not numbered as required by ILT/RTS.
 SuggestedRemedy
 Number the Tx and Rx in pairs following the approach of IEEE P802.3dj.
 Proposed Response Response Status O

Cl 194 SC 194.9.7 P106 L36 # 130
 Rodes, Roberto Coherent
 Comment Type T Comment Status X
 3dB bandwidth of the fiber emulator filter is currently TBD
 SuggestedRemedy
 Change TBD with 52.6GHz. Contribution justifying the value will be presented
 Proposed Response Response Status O

Cl 194 SC 194.9 P103 L49 # 110
 Dawe, Piers Nvidia
 Comment Type ER Comment Status X
 There is far too much duplication between 193 and 194, which wastes readers' time and makes work for editors.
 SuggestedRemedy
 The definitions section is "low hanging fruit". Delete nearly all of 194.9, keeping able 194-14, The 3 dB bandwidth fA of the fiber emulation filter for TDECQ measurement
 Proposed Response Response Status O

Cl 194 SC 194.9.13 P108 L43 # 72
 Murty, Ramana Broadcom
 Comment Type TR Comment Status X
 Incorrect reference for RIN_OMA calculation.
 SuggestedRemedy
 Replace 180.9.14 with 180.9.13.
 Proposed Response Response Status O

Cl 194 SC 194.9.2 P105 L10 # 46
 Lewis, David Speciphy / Lumentum
 Comment Type TR Comment Status X
 800GBASE-SR4-30 should be 800GBASE-MR4
 SuggestedRemedy
 Change -SR4-30 to -MR4
 Proposed Response Response Status O

Cl 194 SC Tab;e 194-3 P85 L4 # 63
 Simms, William NVIDIA
 Comment Type ER Comment Status X
 typo in table 194-3, column header on right should be 800GBASE...
 SuggestedRemedy
 change 1.6TBase to 800GBASE
 Proposed Response Response Status O