Cl **167** *SC* **167.10.3.3** *P* **65** *L* **1** # I-1

Pimpinella, Rick Panduit Corp.

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

Experimental data shows APC MPO connectors are not required nor are they compatible with Structured Cabling Method B (hybrid patch cords required). Data shows no degradation in performance due to the maximum discrete reflectance of -20 dB (or more).

SuggestedRemedy

Replace APC MPO specification with Flat polished. The Standard should only specify one connector type for widespread compatibility.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Contributions supporting flat polished MDIs and contributions supporting angled polished MDIs were reviewed by the Task Force.

After discussion the Task Force decided to include flat and angled MPO for multifiber MDIs.

A straw poll was taken, "I support including an APC option for the MDI" with responses Y: 15, N: 4, A: 3

The APC option is described as, “an alternative, optional angled fiber interface”, in accordance with another straw poll:
“For the APC option at the MDI, I prefer:"
Normative: 5
Informative: 11
No preference: 4
Abstain: 0ence: 4
Abstain: 0

The word “informative” is not used in accordance with the SA style guide.

Change the text of 167.10.3.3 to the following:

167.10.3.3 MDI requirements for 200GBASE-VR2, 400GBASE-VR4, 200GBASE-SR2, and 400GBASE-SR4

The MDI shall optically mate with the compatible plug on the optical fiber cabling.

For 200GBASE-VR2, 400GBASE-VR4, 200GBASE-SR2, and 400GBASE-SR4 with a flat fiber interface the MDI adapter or receptacle shall meet the dimensional specifications for interface 7-1-3: MPO adapter interface - opposed keyway configuration, or interface 7-1-10: MPO active device receptacle, flat interface, as defined in IEC 61754-7-1. The plug terminating the optical fiber cabling shall meet the dimensional specifications of interface 7-1-4: MPO female plug connector, flat interface for 2 to 12 fibres, as defined in IEC 61754-7-1. Figure 167–9 shows an MPO female plug connector with flat interface, and an MDI. The MDI connection shall meet the interface performance specifications of IEC 61753-1 and IEC 61753-022-2 for performance grade Bm/2m.

Note - Flat fiber interfaces are the most commonly used for multifiber multimode systems

As an alternative, an optional angled fiber interface may be used for 200GBASE-VR2, 400GBASE-VR4, 200GBASE-SR2, and 400GBASE-SR4. If the angled fiber interface is used, the MDI adapter or receptacle shall meet the dimensional specifications for interface 7-1-3: MPO adapter interface - opposed keyway configuration, or interface 7-1-9: MPO active device receptacle, angled interface, as defined in IEC 61754-7-1. The plug terminating the optical fiber cabling shall meet the dimensional specifications of interface 7-1-1: MPO female plug connector, down-angled interface for 2 to 12 fibres, as defined in IEC 61754-7-1. Figure 167–10 shows an MPO female plug connector with angled interface, and an MDI. The MDI connection shall meet the interface performance specifications of IEC 63267-1 for performance grade Bm/1m(a).

A flat MDI adapter or receptacle is only compatible with a flat plug terminating the optical fiber cabling, and an angled MDI adapter or receptacle is only compatible with an angled plug terminating the optical fiber cabling.

(a) IEC 63267-1 with performance grade 1m specification is available as a Pre-Release Version (PRV) Final Draft International Standard (FDIS); final published version of this specification will be available in 2023.

Insert a new Figure 167-9 with Figure 167-11 of D1.2 (flat MPO and MDI). Update figure numbering.

Update the PICs in 167.11.4.6 as follows with editorial license:
OC1-OC7
No changes

OC8
MDI mating, 100GBASE-VR1, 100GBASE-SR1, 200GBASE-VR2, 200GBASE-SR2, 400GBASE-VR4, and 400GBASE-SR4 with flat multifiber connector
167.10.3.3
MDI optically mates with plug on the cabling, performance grade Bm/2m

OC9
MDI mating, 100GBASE-VR1, 100GBASE-SR1, 200GBASE-VR2, 200GBASE-SR2, 400GBASE-VR4, and 400GBASE-SR4 with angled multifiber connector
167.10.3.3
MDI optically mates with plug on the cabling, performance grade Bm/1m

OC10
MDI dimensions for 100GBASE-VR1, 100GBASE-SR1, 200GBASE-VR2, 200GBASE-SR2, 400GBASE-VR4, and 400GBASE-SR4 with flat multifiber connector
167.10.3.3
Per IEC 61754-7-1 interface 7-1-3 or interface 7-1-10

OC11

MDI dimensions for 100GBASE-VR1, 100GBASE-SR1, 200GBASE-VR2, 200GBASE-SR2, 400GBASE-VR4, and 400GBASE-SR4 with angled multifiber connector
167.10.3.3
Per IEC 61754-7-1 interface 7-1-3 or interface 7-1-9

OC12
Cabling connector dimensions for 100GBASE-VR1, 100GBASE-SR1, 200GBASE-VR2, 200GBASE-SR2, 400GBASE-VR4, and 400GBASE-SR4 with flat multifiber connector
167.10.3.3
Per IEC 61754-7-1 interface 7-1-4

OC13
Cabling connector dimensions for 100GBASE-VR1, 100GBASE-SR1, 200GBASE-VR2, 200GBASE-SR2, 400GBASE-VR4, and 400GBASE-SR4 with angled multifiber connector
167.10.3.3
Per IEC 61754-7-1 interface 7-1-1

OC14
MDI requirements for 100GBASE-VR1, 100GBASE-SR1, 200GBASE-VR2, 200GBASE-SR2, 400GBASE-VR4, and 400GBASE-SR4 with flat multifiber connector
167.10.3.3
Per IEC 61753-1 and IEC 61753-022-2, performance grade Bm/2m

OC15
MDI requirements for 100GBASE-VR1, 100GBASE-SR1, 200GBASE-VR2, 200GBASE-SR2, 400GBASE-VR4, and 400GBASE-SR4 with angled multifiber connector
167.10.3.3
Per IEC 63267-1, performance grade Bm/1m

Cl **80** *SC* **80.1.5** *P* **26** *L* **10** # I-2

Ran, Adee
Cisco Systems, Inc.

Comment Type **ER** *Comment Status* **A**

(This comment is about nomenclature tables and spans two clauses, 80 and 116)

Clause 80:
In Table 80-5 and similar ones, the cells in the "Nomenclature" row have always been grouped per clause, even when there are more than one item/column per clause; for example, in this table, clause 81 has both RS and CGMII columns, and clause 140 has three columns for the three PHYs it defines. Also, the columns are usually sorted by clause number (with annexes near clauses of the same number); Table 116-5 is the single exception.

In this draft, Clause 167 appears twice and isn't grouped, and is breaking the sort order.

While this column order may yield a nice "diagonal" structure to the table given the row order, the existing tables, e.g., Table 80-2, do not have this diagonal structure; columns are ordered by clause number and rows are ordered by PHY type criteria (speed, reach, number of lanes). See comment I-54 in https://www.ieee802.org/3/dc/comments/P8023_D3p0_comments_final_by_cls.pdf#page=26 for details.

Clause 116:

In Table 116-4, Clause 167 is breaking the sort order.

In Table 116-5, Clause 167 appears twice, ungrouped; the unsorted clause order in the existing table is inconsistent with all other tables, so a "167" group could appear either to the left (after 120E) or to the right (after 122). It seems preferable to place it at the left side, consistent with the reach order.

SuggestedRemedy

Clause 80:
In Table 80-5, in the "nomenclature" row, group 100GBASE-VR1 and 100GBASE-SR1 under one clause cell (167), and make that column-group appear next to "140" at the right.

Clause 116:
In Table 116-4, move the column-group of Clause 167 to the right of Clause 138.
In Table 116-5, in the "nomenclature" row, group 400GBASE-VR4 and 400GBASE-SR4 under one clause cell (167), and make that column-group appear to the right of to "120E".

Response *Response Status* **C**

ACCEPT.

Cl **167** *SC* **167.3.1** *P* **46** *L* **20** # I-3

Ran, Adee Cisco Systems, Inc.

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

"Descriptions of overall system delay constraints and the definitions for bit times and pause_quanta, can be found"

No need for a comma.

SuggestedRemedy

Delete the comma.

Response *Response Status* **C**

ACCEPT.

Cl **167** *SC* **167.3.2** *P* **46** *L* **33** # I-4

Ran, Adee Cisco Systems, Inc.

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

"If the PMD service interface is physically instantiated so that the Skew at SP2 can be measured, then the Skew at SP2 is limited to 43 ns and the Skew Variation at SP2 is limited to 400 ps."

The second part of this statement is relevant only for 200G and 400G PMDs; for 100G PMDs there is no skew variation at TP2 since there is a single serial bit stream. Compare to the similar statements in 138.3.2.1, 139.3.2, and 140.3.2, which read:

"If the PMD service interface is physically instantiated so that the Skew at SP2 can be measured, then the Skew at SP2 is limited to 43 ns as defined by 135.5.3.5. Since the signal at the PMD service interface represents a serial bit stream, there is no Skew Variation at this point.".

Similarly for SP5 (line 42-43).

Even if 100G PMDs do not have a separate subclause (as was done in clause 138), the distinction between single-lane and multi-lane PMDs should still be made for consistency.

SuggestedRemedy

Append the following to the statement about Skew at SP2 (quoted) and the statement about Skew at SP5:

"For 100GBASE-VR1 and 100GBASE-SR1, since the signal at the PMD service interface represents a serial bit stream, there is no Skew Variation at this point."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change relevant sections to:
"If the PMD service interface is physically instantiated so that the Skew at SP2 can be measured, then the Skew at SP2 is limited to 43 ns and the Skew Variation at SP2 is limited to 400 ps. For 100GBASE-VR1 and 100GBASE-SR1, since the signal at the PMD service interface represents a serial bit stream, there is no Skew Variation at this point."

and

"If the PMD service interface is physically instantiated so that the Skew at SP5 can be measured, then the Skew at SP5 shall be less than 145 ns and the Skew Variation at SP5 shall be less than 3.6 ns. For 100GBASE-VR1 and 100GBASE-SR1, since the signal at the PMD service interface represents a serial bit stream, there is no Skew Variation at this point."

Cl **167** *SC* **167.5.1** *P* **48** *L* **31** # I-5

Ran, Adee Cisco Systems, Inc.

Comment Type **GR** *Comment Status* **A**

"TP1<0:3> and TP4<0:3> are informative reference points that may be useful to implementers for testing components (these test points will not typically be accessible in an implemented system)."

Per SA guidelines interspersed normative and informative text is not allowed. As a result the word "informative" has been replaced in similar text in 802.3dc with "optional". See comment i-3 in https://www.ieee802.org/3/dc/comments/P8023_D3p0_comments_final_by_cls.pdf#page=2.

Also, the current text states that "these test points will not typically be available", but as noted in a late comment to 802.3dc, the PMD service interface is nowadays typically accessible in modules (it is part of the "CDR" function), so it is not a statement of fact and should be softened. Being late, that comment (R1-LATE-5 in https://www.ieee802.org/3/dc/comments/P8023_D3p1_comments_received_LATE_by_id.pdf) has not been implemented, but the claim is valid.

SuggestedRemedy

Change "TP1<0:3> and TP4<0:3> are informative reference points that may be useful to implementers for testing components (these test points will not typically be accessible in an implemented system)."
to
"TP1<0:3> and TP4<0:3> are optional reference points that may be useful to implementers for testing components (these test points may not be accessible in an implemented system)."

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change sentence to:
"TP1<0:3> and TP4<0:3> are optional reference points that may be useful to implementers for testing components (these test points might not be accessible in an implemented system)."

Use "might not" instead of "may not" to avoid ambiguity.

Cl **167** *SC* **167.6** *P* **51** *L* **1** # I-6

Ran, Adee Cisco Systems, Inc.

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

"as the PCS and the RS-FEC sublayer are capable of receiving the lanes in any arrangement"

This subclause discusses only 200G and 400G PHYs, in which there is no RS-FEC sublayer. The PCS layer (which includes a FEC function) is indeed capable of receiving lanes in any arrangement.

This has been noted in comment 124 against D2.0 but unfortunately my suggested remedy was inaccurate and left the "RS-FEC" in the text.

SuggestedRemedy

Change the quoted text to "as the PCS sublayer is capable of receiving the lanes in any arrangement".

Response *Response Status* **C**

ACCEPT.

Cl **167** *SC* **167.7.1** *P* **52** *L* **19** # I-7

Ran, Adee Cisco Systems, Inc.

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

Table 167-7 has both en-dash (line 19 "–4.6") and hyphen (line 25 "-4.4") for negative numbers.

For the Minus sign it is conventional to use en-dash.

Also in Table 167-8 and maybe elsewhere (it is difficult to find all instances in the PDF but it should be easier in the Frame Maker source).

SuggestedRemedy

Change all hyphens that denote minus sign to en-dash, in this table, in table 167-8 (7 instances) and elsewhere as required.

Response *Response Status* **C**

ACCEPT.

Cl **167** *SC* **167.8.8** *P* **59** *L* **16** # I-8

Ran, Adee Cisco Systems, Inc.

Comment Type **ER** *Comment Status* **A**

"3E-3" - the "e" notation is not part of standard style.

Also in 167.8.9.

SuggestedRemedy

Change to 3 × 10^–3 (Note: multiplication sign, en dash, nonbreaking spaces, and superscript), in both places.

Response *Response Status* **C**

ACCEPT.

Cl **167** *SC* **167.8.9** *P* **59** *L* **27** # I-9

Ran, Adee Cisco Systems, Inc.

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

The terms P_max and P_min appear in the referenced 140.7.7 formatted as variables (with P in italic).

It would make sense for P_average to be formatted similarly.

SuggestedRemedy

Format P_Max, P_min, and P_average with P in italic.

Response *Response Status* **C**

ACCEPT.

Cl **167** *SC* **167.8.14** *P* **60** *L* **43** # I-10

Ran, Adee Cisco Systems, Inc.

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

"see 167.1.1 and 167.8.2" - these are not active cross references.

SuggestedRemedy

Make them active.

Response *Response Status* **C**

ACCEPT.

Cl **167** *SC* **167.8.14.1** *P* **61** *L* **6** # I-11

Ran, Adee Cisco Systems, Inc.

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

Jitter pk-pk is specified as a number of UI, and f has dimension of frequency, so the numerator should also be a frequency.
See comment I-28 in https://www.ieee802.org/3/dc/comments/P8023_D3p0_comments_final_by_cls.pdf#page=18.

SuggestedRemedy

Change "2 × 10^5/f" to "2 × 10^5 Hz/f".

Response *Response Status* **C**

ACCEPT.

Cl **167** *SC* **167.11.4.2** *P* **70** *L* **12** # I-12

Ran, Adee Cisco Systems, Inc.

Comment Type **ER** *Comment Status* **A**

PMD_lane_by_lane_transmit_disable - no underscores necessary (this is a function, and there is no variable with this name).

Also for PMD_fault in M5, PMD_transmit_fault in M6, and PMD_receive_fault in M7 - no underscores necessary when referring to the function.

SuggestedRemedy

Change to "PMD lane-by-lane transmit disable", "PMD transmit fault", and "PMD receive fault", as in the referenced subclauses.

Response *Response Status* **C**

ACCEPT.

Cl **167** *SC* **167.9.1** *P* **61** *L* **18** # I-13

Ran, Adee Cisco Systems, Inc.

Comment Type **G** *Comment Status* **A**

The standard text for the "General safety" subclause in 802.3dc D3.1 is "Equipment subject to this clause shall conform to the general safety requirements in J.2."

SuggestedRemedy

Change per comment.

Response *Response Status* **C**

ACCEPT.

Cl **FM** *SC* **FM** *P* **1** *L* **10** # I-14

Ran, Adee Cisco Systems, Inc.

Comment Type **GR** *Comment Status* **A**

Based on the current amendment order, 802.3de is expected to be the 6th amendment of 802.3-2022. As a result, 802.3cs is expected to be the second amendment, and 802.3de is expected to be the third.

SuggestedRemedy

Change "Amendment 4" to "Amendment 3" on page 1 and page 17.

Delete the heading and subsequent paragraph for "IEEE Std 802.3de™-202x" starting on page 11.

Decrement the amendment numbers of 802.3cs and 802.3db on page 12.

Response *Response Status* **C**

ACCEPT.

Cl **167** *SC* **167.7.1** *P* **52** *L* **27** # I-15

Brown, Matthew Huawei Technologies Canada

Comment Type **E** *Comment Status* **R**

The row for "Transmitter and dispersion eye closure for PAM4 (TDECQ), each lane (max)" has 4.4 dB in both columns. For consistency with other rows with same values, the two columns should be merged.

SuggestedRemedy

For "Transmitter and dispersion eye closure for PAM4 (TDECQ), each lane (max)" merge the two value columns with a single instance of "4.4".

Response *Response Status* **C**

REJECT.
TDECQ is measured using different fiber emulation filters for VR and SR. TDECQ (max) is specified in separate columns for VR and SR to note this difference even though both PMDs allow the same numerical limit for TDECQ(max) of 4.4 dB.

Cl **167** *SC* **167.8.6.1** *P* **58** *L* **41** # I-16

Brown, Matthew Huawei Technologies Canada

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

Figure 167-5 has a mixture of font sizes.
The IEEE SA Standards Style Manual provides the following guidance for fonts in graphics:
"Arial font is preferred."
"Preferred font size is 9 points (can be 8 or 10 points if needed)."

SuggestedRemedy

For text in Figure 167-5, use a consistent font size, preferably 9 pt.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Use Arial 9 pt for the text in Figure 167-5.

Cl **167** *SC* **167.9.1** *P* **61** *L* **17** # I-19

Lingle, Robert Georgia Institute of Technology

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

The wide variety of references to J.2 in IEEE Std 802.3-2018 and its approved amendments are being made uniform in IEEE P802.3dc Maintenance #16 Task Force. IEEE P802.3db should align its reference to J.2 with the format in the final draft of IEEE 802.3 (IEEE P802.3dc).

SuggestedRemedy

Align the reference to J.2 in IEEE 802.3db D3.0 Subclause 167.9.1 to conform to the latest format in IEEE P802.3dc. At this time that would be to change "All equipment subject to this clause shall conform to J.2." to "Equipment subject to this clause shall conform to the general safety requirements in J.2."

Response *Response Status* **C**

ACCEPT.

Cl **167** *SC* **167.9.1** *P* **61** *L* **17** # I-20

Ghiasi, Ali Ghiasi Quantum LLC,Marvell Semiconductor, Inc.

Comment Type **ER** *Comment Status* **R**

No reference provided for J.2

SuggestedRemedy

Please provide reference J.2.

Response *Response Status* **C**

REJECT.
J.2 is part of Annex J of the base document and is marked as an external cross reference in the draft.

Cl **FM** *SC* **FM** *P* **1** *L* **10** # I-21

Grow, Robert RMG Consulting

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

According to my records, Mr. Law assigned P802.3db to be Amendment 3 on 25 January. (Amendment 1 being P802.3dd, and Amendment 2 being P802.3cs.

SuggestedRemedy

If amendment numbers remain unchanged renumber as Amendment 3. Delete "IEEE Std 802.3de-202x" at line 35.

Response *Response Status* **C**

ACCEPT.

Cl **FM** *SC* **FM** *P* **3** *L* **3** # I-22

Grow, Robert RMG Consulting

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

The reach numbers are confusing. What makes the difference between 50 m and 100 m reach? Further, the numbers do not agree with Table 167-6.

SuggestedRemedy

Delete "up to 50 m and".

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Change "This amendment to IEEE Std 802.3-202x adds Physical Layer specifications and Management Parameters for 100 Gb/s, 200 Gb/s, and 400 Gb/s Ethernet optical interfaces for reaches up to 50 m and up to 100 m based on 100 Gb/s per wavelength optical signaling."

to
"This amendment to IEEE Std 802.3-202x adds Physical Layer specifications and Management Parameters for 100 Gb/s, 200 Gb/s, and 400 Gb/s Ethernet optical interfaces based on 100 Gb/s per wavelength optical signaling over multimode fiber."

Prior examples:
802.3cd
"Clause 131 through Clause 140 and Annex 135A through Annex 136D are added to IEEE Std 802.3-2018 by this amendment to specify IEEE 802.3 Media Access Control (MAC) parameters, Physical Layer specifications, and management parameters for the transfer of IEEE 802.3 format frames at 50 Gb/s, 100 Gb/s, and 200 Gb/s."

802.3cu
"This amendment to IEEE Std 802.3-2018 adds Physical Layer specifications and management parameters for 100 Gb/s and 400 Gb/s Ethernet optical interfaces for reaches up to 10 km based on 100 Gb/s per wavelength optical signaling."

802.3cm
"This amendment to IEEE Std 802.3-2018 adds Clause 150. This amendment adds Physical Layer (PHY) specifications and management parameters for 400 Gb/s operation on four pairs (400GBASE-SR4.2) and eight pairs (400GBASE-SR8) of multimode fiber, over reaches of at least 100 m."

Cl **FM** *SC* **FM** *P* **4** *L* **9** # I-23

Grow, Robert RMG Consulting

Comment Type **ER** *Comment Status* **A**

The front matter mandatory text in this draft is not current. (Not having FrameMaker, I checked the 2021 Word front matter template and and P802.3/D3.2 finding they agree.) I find multiple differences on page 4 in the legal language required for a standard. I note the IMPORTANT NOTE that precedes the Participant list is missing.

SuggestedRemedy

Update to text found in current IEEE SA template (https://standards.ieee.org/develop/drafting-standard/resources/).

Response *Response Status* **U**

ACCEPT.

Cl **FM** *SC* **FM** *P* **11** *L* **39** # I-24

Grow, Robert RMG Consulting

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

The description of Section Nine has been changed during balloting of P802.3.

SuggestedRemedy

Replace with the current description in P802.3/D3.2.

Response *Response Status* **C**

ACCEPT.

Cl **FM** *SC* **FM** *P* **11** *L* **50** # I-25

Grow, Robert RMG Consulting

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

P802.3de has been assigned amendment number 6.

SuggestedRemedy

Delete and renumber subsequent amendment numbers in the following descriptions.

Response *Response Status* **C**

ACCEPT.

Cl **FM** *SC* **FM** *P* **12** *L* **6** # I-26

Grow, Robert RMG Consulting

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

This description does not agree with the latest self description in P802.3cs/D3.2.

SuggestedRemedy

Replace with current description in P802.3cs/D3.2.

Response *Response Status* **C**

ACCEPT.

Cl **45** *SC* **45.2** *P* **20** *L* **3** # I-27

Grow, Robert RMG Consulting

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

Base text error.

SuggestedRemedy

P802.3/D3.2 has this as "MDI Interface registers"

Response *Response Status* **C**

ACCEPT.

Cl **167** *SC* **167.8.6** *P* **58** *L* **27** # I-28

Ghiasi, Ali — Ghiasi Quantum LLC,Marvell Semiconductor, Inc.

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

802.3db draft for TDECQ measurement references 121.8.5, the actual TDECQ measurement details are in 121.8.5.3 and this clause iteratively adjust tap coefficients: see text below:
"The equalizer tap coefficients are iteratively adjusted and SERL and SERR calculated until the largest of SERL and SERR is minimized. Then, if the larger of SERL and SERR is greater than the target SER of 4.8 × 10–4, the value of sigmaG is decreased and the process of equalizer optimization is repeated; If the larger of SERL and SERR is lower than the target SER of 4.8 × 10–4, then the value of sigmaG is increased and the process of equalizer optimization is repeated.
When the larger of SERL and SERR is equal to the target SER of 4.8 × 10–4, and the value of sigmaG cannot be increased by further optimization of the equalizer tap coefficients, then TDECQ is calculated."

The process of iterative full grid search for 9 tap equalizer is ~35 seconds compare to ~1 seconds for MMSE. There is merits to include optional MMSE test method in addition to full grid search.

SuggestedRemedy

Given that MMSE vs iterative has R^2=0.999 but reduces test time by >30x task force should add optional MMSE method to speed up the test time. The issue of test time will only get worse with 802.3df PMDs some using >20 taps. The classic MMSE test method can be written:
For given input signal x[n]=x(nT), n is equalizer tap and T is the unit interval
The output signal given by y[n]=y(nT)
The output of linear equalizer with 5 or 9 taps (N) given by = SUM(k=0 to N)wk x[n-k], where wk is the weight at 4th tap.
One can use matrix notation to recast the convolution as :
y[n]=x^T[n}w[n]
MMSE algorithm can start with w[1]=0 then compute for n=1, 2, ..
y[n]=x^T[n]w[n]
e[n]=a[n] - y[n] the error signal, a[n] desired response at n sample time
w[n+1]=w[n] + mu e[n]x[n], mu step size and e[n] is the error signal.

Ghiasi and Le Cheminant will bring the full optional MMSE proposal to the task force.

Proposed Response *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Cl **167** *SC* **167.8.13** *P* **60** *L* **11** # I-29

Rannow, R K — silverdraft supercomputing

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

a) The optical return loss is 12 dB.

RL of only 12 dB is an exception appears a bit ambiguous.

This should perhaps be set as a min or max level. RL = 12dB

SuggestedRemedy

Range or limit?

Response *Response Status* **C**

REJECT.
The draft calls for the return loss to be set to the specified value for RIN_12_OMA measurement. This value is used in a definition that is described in a measurement method, and therefore does not require a tolerance specifcation.

Similar text is used in Clauses 138 and 150 to specify optical return loss.

Cl **30** *SC* **30.5.1.1.2** *P* **19** *L* **15** # I-30

Grow, Robert RMG Consulting

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

P802.3 sort order for aMAUTypeList was clarified to be: 1. increasing rate, 2. Alphanumeric (see P802.3/D3.0, #i-51).

SuggestedRemedy

Six editing instructions are needed to specify:
100GBASE-SR1 inserted after 100GBASE-R
100GBASE-VR1 inserted after 100GBASE-SR10
200GBASE-SR2 inserted after 200GBASE-R
200GBASE-VR2 inserted after 200GBASE-SR4
400GBASE-SR4 inserted after 400GBASE-R
400GBASE-VR4 inserted after 400GBASE-SR16

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Change 30.5.1.1.2 to the following:

Insert the following new entry into “APPROPRIATE SYNTAX” in 30.5.1.1.2 after 100GBASE-R as follows:
100GBASE-SR1 100GBASE-R PCS/PMA over multimode fiber PMD with reach up to at least 100 m as specified in Clause 167

Insert the following new entry into “APPROPRIATE SYNTAX” in 30.5.1.1.2 after 100GBASE-SR10 as follows:
100GBASE-VR1 100GBASE-R PCS/PMA over multimode fiber PMD with reach up to at least 50 m as specified in Clause 167

Insert the following new entry into “APPROPRIATE SYNTAX” in 30.5.1.1.2 after 200GBASE-R as follows
200GBASE-SR2 200GBASE-R PCS/PMA over 2 lane multimode fiber PMD with reach up to at least 100 m as specified in Clause 167

Insert the following new entry into “APPROPRIATE SYNTAX” in 30.5.1.1.2 after 200GBASE-SR4 as follows
200GBASE-VR2 200GBASE-R PCS/PMA over 2 lane multimode fiber PMD with reach up to at least 50 m as specified in Clause 167

Insert the following new entries into “APPROPRIATE SYNTAX” in 30.5.1.1.2 after 400GBASE-R as follows
400GBASE-SR4 400GBASE-R PCS/PMA over 4 lane multimode fiber PMD with reach up to at least 100 m as specified in Clause 167

Insert the following new entries into “APPROPRIATE SYNTAX” in 30.5.1.1.2 after 400GBASE-SR16 as follows
400GBASE-VR4 400GBASE-R PCS/PMA over 4 lane multimode fiber PMD with reach up to at least 50 m as specified in Clause 167

Cl **167** *SC* **167.5.1** *P* **48** *L* **32** # I-31

Healey, Adam Broadcom Inc.

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

The IEEE SA Standards Style Manual (12.1) states that "Interspersed normative and informative text is not allowed." Labeling aspects of a normative clause as "informative" should be avoided.

SuggestedRemedy

Change "TP1<0:3> and TP4<0:3> are informative reference points..." to "TP1<0:3> and TP4<0:3> are optional reference points...".

Response *Response Status* **C**

ACCEPT.

Cl **167** *SC* **167.7.2** *P* **53** *L* **36** # I-32

Healey, Adam Broadcom Inc.

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

The IEEE SA Standards Style Manual (12.1) states that "Interspersed normative and informative text is not allowed." Labeling aspects of a normative clause as "informative" should be avoided.

SuggestedRemedy

In Table 167-8 footnote b, change "Average receive power, each lane (min) is informative and not the principal indicator..." to "Average receive power, each lane (min) is not the principal indicator...".

Response *Response Status* **C**

ACCEPT.

Cl **167** *SC* **167.10.3.3** *P* **66** *L* **6** # I-33

Tang, Yi
Cisco Systems, Inc.

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

The current MDI defined in D3.0 indicates an angled polished MPO. Given that the broad deployment/ecosystem for MMF MPO-12 is dominated by PC, adoption of an APC MDI will cause broad user challenges during deployment resulting in out of spec channels.

The PC MPO-12 meets the -20dB maximum discrete reflectance requirement. The adoption of APC for the MDI doesn't result in a meaningful improvement on link ORL performance and owing to the single-lane specifications which use a PC polished LC connector, the link specifications need to work with a flat MDI regardless.

Propose .3db shall stay with PC MPO-12 definition consistent with all previous standards such as .3cd to address a broad market need.

A supporting presentation will be provided.

SuggestedRemedy

Reference or duplicate the MDI requirements - MPO with flat interface - used in clause 138.10.3.3 "MDI requirements for 100GBASE-SR2 and 200GBASE-SR4" (IEEE Std 802.3cd-2018, Page 272)

Remove last two sentences of 167.10.3.2

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Contributions supporting flat polished MDIs and contributions supporting angled polished MDIs were reviewed by the Task Force.

After discussion the Task Force decided to include flat and angled MPO for multifiber MDIs.

A straw poll was taken, "I support including an APC option for the MDI" with responses Y: 15, N: 4, A: 3

The APC option is described as, “an alternative, optional angled fiber interface”, in accordance with another straw poll:
“For the APC option at the MDI, I prefer:"
Normative: 5
Informative: 11
No preference: 4
Abstain: 0

The word “informative” is not used in accordance with the SA style guide.

Change the text of 167.10.3.3 to the following:

167.10.3.3 MDI requirements for 200GBASE-VR2, 400GBASE-VR4, 200GBASE-SR2, and 400GBASE-SR4

The MDI shall optically mate with the compatible plug on the optical fiber cabling.

For 200GBASE-VR2, 400GBASE-VR4, 200GBASE-SR2, and 400GBASE-SR4 with a flat fiber interface the MDI adapter or receptacle shall meet the dimensional specifications for interface 7-1-3: MPO adapter interface - opposed keyway configuration, or interface 7-1-10: MPO active device receptacle, flat interface, as defined in IEC 61754-7-1. The plug terminating the optical fiber cabling shall meet the dimensional specifications of interface 7-1-4: MPO female plug connector, flat interface for 2 to 12 fibres, as defined in IEC 61754-7-1. Figure 167–9 shows an MPO female plug connector with flat interface, and an MDI. The MDI connection shall meet the interface performance specifications of IEC 61753-1 and IEC 61753-022-2 for performance grade Bm/2m.

Note - Flat fiber interfaces are the most commonly used for multifiber multimode systems

As an alternative, an optional angled fiber interface may be used for 200GBASE-VR2, 400GBASE-VR4, 200GBASE-SR2, and 400GBASE-SR4. If the angled fiber interface is used, the MDI adapter or receptacle shall meet the dimensional specifications for interface 7-1-3: MPO adapter interface - opposed keyway configuration, or interface 7-1-9: MPO active device receptacle, angled interface, as defined in IEC 61754-7-1. The plug terminating the optical fiber cabling shall meet the dimensional specifications of interface 7-1-1: MPO female plug connector, down-angled interface for 2 to 12 fibres, as defined in IEC 61754-7-1. Figure 167–10 shows an MPO female plug connector with angled interface, and an MDI. The MDI connection shall meet the interface performance specifications of IEC 63267-1 for performance grade Bm/1m(a).

A flat MDI adapter or receptacle is only compatible with a flat plug terminating the optical fiber cabling, and an angled MDI adapter or receptacle is only compatible with an angled plug terminating the optical fiber cabling.

(a) IEC 63267-1 with performance grade 1m specification is available as a Pre-Release Version (PRV) Final Draft International Standard (FDIS); final published version of this specification will be available in 2023.

Insert a new Figure 167-9 with Figure 167-11 of D1.2 (flat MPO and MDI). Update figure numbering.

Update the PICs in 167.11.4.6 as follows with editorial license:
OC1-OC7
No changes

OC8
MDI mating, 100GBASE-VR1, 100GBASE-SR1, 200GBASE-VR2, 200GBASE-SR2, 400GBASE-VR4, and 400GBASE-SR4 with flat multifiber connector
167.10.3.3
MDI optically mates with plug on the cabling, performance grade Bm/2m

OC9

MDI mating, 100GBASE-VR1, 100GBASE-SR1, 200GBASE-VR2, 200GBASE-SR2, 400GBASE-VR4, and 400GBASE-SR4 with angled multifiber connector
167.10.3.3
MDI optically mates with plug on the cabling, performance grade Bm/1m

OC10
MDI dimensions for 100GBASE-VR1, 100GBASE-SR1, 200GBASE-VR2, 200GBASE-SR2, 400GBASE-VR4, and 400GBASE-SR4 with flat multifiber connector
167.10.3.3
Per IEC 61754-7-1 interface 7-1-3 or interface 7-1-10

OC11
MDI dimensions for 100GBASE-VR1, 100GBASE-SR1, 200GBASE-VR2, 200GBASE-SR2, 400GBASE-VR4, and 400GBASE-SR4 with angled multifiber connector
167.10.3.3
Per IEC 61754-7-1 interface 7-1-3 or interface 7-1-9

OC12
Cabling connector dimensions for 100GBASE-VR1, 100GBASE-SR1, 200GBASE-VR2, 200GBASE-SR2, 400GBASE-VR4, and 400GBASE-SR4 with flat multifiber connector
167.10.3.3
Per IEC 61754-7-1 interface 7-1-4

OC13
Cabling connector dimensions for 100GBASE-VR1, 100GBASE-SR1, 200GBASE-VR2, 200GBASE-SR2, 400GBASE-VR4, and 400GBASE-SR4 with angled multifiber connector
167.10.3.3
Per IEC 61754-7-1 interface 7-1-1

OC14
MDI requirements for 100GBASE-VR1, 100GBASE-SR1, 200GBASE-VR2, 200GBASE-SR2, 400GBASE-VR4, and 400GBASE-SR4 with flat multifiber connector
167.10.3.3
Per IEC 61753-1 and IEC 61753-022-2, performance grade Bm/2m

OC15
MDI requirements for 100GBASE-VR1, 100GBASE-SR1, 200GBASE-VR2, 200GBASE-SR2, 400GBASE-VR4, and 400GBASE-SR4 with angled multifiber connector
167.10.3.3
Per IEC 63267-1, performance grade Bm/1m

Cl **167** *SC* **167.7.1** *P* **52** *L* **38** # I-34

Tang, Yi — Cisco Systems, Inc.

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

Optical return loss tolerance is specified as 12dB in D3.0 - levaraged from previous generation specs. No data/information has been presented to demonstrate that the transmitter can indeed tolerate 12dB ORL at 53GBd. By adopting the same level of RX reflectance and TX return loss tolerance as 50G, the current spec put 100G operation burden solely on TX even though it is likely more cost effective to address the issue at RX.

Propose lower max receiver reflectance to -15dB and set optical return loss tolerance to 15dB

A supporting presentation will be provided.

SuggestedRemedy

Page 52, Line 38, 167.7.1:
Change "RIN12OMA" to "RIN15OMA"

Page 52, Line 39, 167.7.1:
Change "Optical return loss tolerance (max)" from 12dB to 15dB

Page 53, Line 22, 167.7.2:
Change "Receiver reflectance (max)" from -12dB to -15dB

Page 56, Line 15, 167.8.1:
Change "RIN12OMA" to "RIN15OMA"

Page 56, 167.8.12:
Line 1 - Change "RIN12OMA" to "RIN15OMA"
Line 4 - Change "12 dB" to "15 dB"

Page 56, 167.8.14:
Line 33 - Change both "RIN12OMA" to "RIN15OMA"

Page 71, Line 23, 167.11.4.4:
Change "RIN12OMA" to "RIN15OMA"

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Reviewed the presentation https://www.ieee802.org/3/db/public/adhoc/presentations/tang_3db_adhoc_01_042822.pdf.

Set optical return loss tolerance (max) to 14 dB and receive reflectance (max) to -15 dB. Change the references to these parameters in Clause 167 as follows:

Page 52, Line 38, 167.7.1:
Change "RIN12OMA" to "RIN14OMA"

Page 52, Line 39, 167.7.1:
Change "Optical return loss tolerance (max)" from 12 dB to 14 dB

Page 53, Line 22, 167.7.2:
Change "Receiver reflectance (max)" from -12 dB to -15 dB

Page 56, Line 15, 167.8.1:
Change "RIN12OMA" to "RIN14OMA"

Page 60, 167.8.12:
Line 1 - Change "RIN12OMA" to "RIN14OMA"
Line 4 - Change "12 dB" to "14 dB"

Page 60, 167.8.14:
Line 33 - Change both "RIN12OMA" to "RIN14OMA"

Page 71, Line 23, 167.11.4.4:
Change "RIN12OMA" to "RIN14OMA"

Cl **167** *SC* **167.10.3.3** *P* **66** *L* **9** # I-35

Maki, Jeffery — Juniper Networks, Inc.

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

The broad market potential for 400GBASE-VR4 and 400GBASE-SR4 is met using the same MDI as for 40GBASE-SR4, 100GBASE-SR4, and 200GBASE-SR4. Similarly the broad market potential for 200GBASE-VS2 and 200GBASE-SR2 is met using the same MDI as for 100GBASE-SR2.

SuggestedRemedy

Change the following text to the proposed text:
MPO adapter interface - Opposed keyway configuration, or interface 7-1-9: MPO active device receptacle, angled interface, as defined in IEC 61754-7-1. The plug terminating the optical fiber cabling shall meet the dimensional specifications of interface 7-1-1: MPO female plug connector, down-angled interface for 2 to 12 fibres, as defined in IEC 61754-7-1.

Proposed text:
MPO adapter interface - opposed keyway configuration, or interface 7-1-10: MPO active device
receptacle, flat interface, as defined in IEC 61754-7-1. The plug terminating the optical fiber cabling shall
meet the dimensional specifications of interface 7-1-4: MPO female plug connector, flat interface for 2 to 12
fibers, as defined in IEC 61754-7-1.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.
Contributions supporting flat polished MDIs and contributions supporting angled polished MDIs were reviewed by the Task Force.

After discussion the Task Force decided to include flat and angled MPO for multifiber MDIs.

A straw poll was taken, "I support including an APC option for the MDI" with responses Y: 15, N: 4, A: 3

The APC option is described as, “an alternative, optional angled fiber interface”, in accordance with another straw poll:
“For the APC option at the MDI, I prefer:"
Normative: 5
Informative: 11
No preference: 4
Abstain: 0

The word “informative” is not used in accordance with the SA style guide.

Change the text of 167.10.3.3 to the following:

167.10.3.3 MDI requirements for 200GBASE-VR2, 400GBASE-VR4, 200GBASE-SR2, and

400GBASE-SR4

The MDI shall optically mate with the compatible plug on the optical fiber cabling.

For 200GBASE-VR2, 400GBASE-VR4, 200GBASE-SR2, and 400GBASE-SR4 with a flat fiber interface the MDI adapter or receptacle shall meet the dimensional specifications for interface 7-1-3: MPO adapter interface - opposed keyway configuration, or interface 7-1-10: MPO active device receptacle, flat interface, as defined in IEC 61754-7-1. The plug terminating the optical fiber cabling shall meet the dimensional specifications of interface 7-1-4: MPO female plug connector, flat interface for 2 to 12 fibres, as defined in IEC 61754-7-1. Figure 167–9 shows an MPO female plug connector with flat interface, and an MDI. The MDI connection shall meet the interface performance specifications of IEC 61753-1 and IEC 61753-022-2 for performance grade Bm/2m.

Note - Flat fiber interfaces are the most commonly used for multifiber multimode systems

As an alternative, an optional angled fiber interface may be used for 200GBASE-VR2, 400GBASE-VR4, 200GBASE-SR2, and 400GBASE-SR4. If the angled fiber interface is used, the MDI adapter or receptacle shall meet the dimensional specifications for interface 7-1-3: MPO adapter interface - opposed keyway configuration, or interface 7-1-9: MPO active device receptacle, angled interface, as defined in IEC 61754-7-1. The plug terminating the optical fiber cabling shall meet the dimensional specifications of interface 7-1-1: MPO female plug connector, down-angled interface for 2 to 12 fibres, as defined in IEC 61754-7-1. Figure 167–10 shows an MPO female plug connector with angled interface, and an MDI. The MDI connection shall meet the interface performance specifications of IEC 63267-1 for performance grade Bm/1m(a).

A flat MDI adapter or receptacle is only compatible with a flat plug terminating the optical fiber cabling, and an angled MDI adapter or receptacle is only compatible with an angled plug terminating the optical fiber cabling.

(a) IEC 63267-1 with performance grade 1m specification is available as a Pre-Release Version (PRV) Final Draft International Standard (FDIS); final published version of this specification will be available in 2023.

Insert a new Figure 167-9 with Figure 167-11 of D1.2 (flat MPO and MDI). Update figure numbering.

Update the PICs in 167.11.4.6 as follows with editorial license:
OC1-OC7
No changes

OC8
MDI mating, 100GBASE-VR1, 100GBASE-SR1, 200GBASE-VR2, 200GBASE-SR2, 400GBASE-VR4, and 400GBASE-SR4 with flat multifiber connector
167.10.3.3
MDI optically mates with plug on the cabling, performance grade Bm/2m

OC9
MDI mating, 100GBASE-VR1, 100GBASE-SR1, 200GBASE-VR2, 200GBASE-SR2, 400GBASE-VR4, and 400GBASE-SR4 with angled multifiber connector
167.10.3.3
MDI optically mates with plug on the cabling, performance grade Bm/1m

OC10
MDI dimensions for 100GBASE-VR1, 100GBASE-SR1, 200GBASE-VR2, 200GBASE-SR2, 400GBASE-VR4, and 400GBASE-SR4 with flat multifiber connector
167.10.3.3
Per IEC 61754-7-1 interface 7-1-3 or interface 7-1-10

OC11
MDI dimensions for 100GBASE-VR1, 100GBASE-SR1, 200GBASE-VR2, 200GBASE-SR2, 400GBASE-VR4, and 400GBASE-SR4 with angled multifiber connector
167.10.3.3
Per IEC 61754-7-1 interface 7-1-3 or interface 7-1-9

OC12
Cabling connector dimensions for 100GBASE-VR1, 100GBASE-SR1, 200GBASE-VR2, 200GBASE-SR2, 400GBASE-VR4, and 400GBASE-SR4 with flat multifiber connector
167.10.3.3
Per IEC 61754-7-1 interface 7-1-4

OC13
Cabling connector dimensions for 100GBASE-VR1, 100GBASE-SR1, 200GBASE-VR2, 200GBASE-SR2, 400GBASE-VR4, and 400GBASE-SR4 with angled multifiber connector
167.10.3.3
Per IEC 61754-7-1 interface 7-1-1

OC14
MDI requirements for 100GBASE-VR1, 100GBASE-SR1, 200GBASE-VR2, 200GBASE-SR2, 400GBASE-VR4, and 400GBASE-SR4 with flat multifiber connector
167.10.3.3
Per IEC 61753-1 and IEC 61753-022-2, performance grade Bm/2m

OC15
MDI requirements for 100GBASE-VR1, 100GBASE-SR1, 200GBASE-VR2, 200GBASE-SR2, 400GBASE-VR4, and 400GBASE-SR4 with angled multifiber connector
167.10.3.3
Per IEC 63267-1, performance grade Bm/1m

Cl **167** *SC* **167.7.1** *P* **52** *L* **29** # I-36

Dawe, Piers J G NVIDIA

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

In VR, the difference between TP2 and TP3 in VR is small so an unfortunately set-up VR transmitter can be in the top left corner of the TDECQ map while still meeting the TDECQ and overshoot specs. With the extra taps and threshold adjust range in this clause's TDECQ it would be well equalised, so there won't be so much padding, conservatism and need for measurement margin vs. TDECQ and TECQ as in earlier clauses, so signals near the nominal spec limits are a concern.

This bad signal has high K' and high but legal overshoot, a bad combination for receivers. Yet the point of a separate VR spec was to allow slower transmitters than are needed for SR, so VR transmitters should not be in this corner.

This is worse at TP2 than after a minimum-bandwidth optical channel at TP3.
The K' limit is similar to VEC in C2M and EVM in coherent: a screen for signals that are bad after equalisation. As it is a free by-product of the TECQ measurement, we can add it to exclude these untypical signals that don't benefit transmitter makers but are bad for receivers.

SuggestedRemedy

For VR, insert a row for K'=TECQ-10.log10(Ceq'), limit 4.4 dB, same as the TECQ limit. K' and Ceq' are the two parts of TECQ as K and Ceq are the two parts of TDECQ.

Response *Response Status* **U**

REJECT.

Reviewed the presentation
https://www.ieee802.org/3/db/public/May22/dawe_3db_01_051922.pdf.

The proposal for adding a specification for K'(max) did not have any support.

Cl **167** *SC* **167.8.6** *P* **57** *L* **40** # I-37

Le Cheminant, Greg Keysight Technologies

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

The current method for optimizing the tap weighs of equalizer in the TDECQ reference receiver is described in clause 121.8.5 (emphasis added):
The equalizer tap coefficients are iteratively adjusted and SERL and SERR calculated until the largest of SERL and SERR is minimized. Then, if the larger of SERL and SERR is greater than the target SER of 4.8 × 10–4, the value of sigmaG is decreased and the process of equalizer optimization is repeated; If the larger of SERL and SERR is lower than the target SER of 4.8 × 10–4, then the value of sigmaG is increased and the process of equalizer optimization is repeated. When the larger of SERL and SERR is equal to the target SER of 4.8 × 10–4, and the value of sigmaG cannot be increased by further optimization of the equalizer tap coefficients, then TDECQ is calculated
Although not explicitly stated, one way to view this is that any combination of tap weights is valid and that all combinations should be tried to ensure the optimum tap weight combination is used when calculating TDECQ.
A subset of this approach would be to minimize the TDECQ penalty by adjusting the equalizer tap weights to minimize the eye closure and then perform the TDECQ calculation. One method to achieve this is through a minimum mean squared error optimization of eye closure. The specific optimization method is not critical, as any method will be a subset of the full search allowed in clause 121. While not guaranteeing the lowest possible TDECQ, reference receivers using an MMSE optimization indicate agreement of TDECQ penalties within 0.1 to 0.2 db. (Any alternative method to the full search must be equal to or greater than the value observed with a full search). There is no risk of false positives with alternative optimization methods.
As reference equalizers use longer equalizers the time required for a full search to optimize tap weights will increase. The clause 167 reference receiver uses a 9-tap equalizer compared to the 5-tap version of clause 121. For the 9-tap equalizer, an MMSE optimization can be performed in approximately 1 second compared to the 10 to 40 seconds required for a full search. Allowing a very small tradeoff of TDECQ penalty for a large reduction in test time should be an available alternative to implementors of the 802.3 db standard. It is worth noting that the vast majority of TDECQ measurements are currently being made using this tradeoff.

SuggestedRemedy

Modify the text of clause 167 by adding the following to the list of exceptions to the TDECQ method described in clause 121.8.5 found on page 57 line 40:
-The tap weight optimization method described in 121.8.5 can be used. Test times can be significantly reduced using other methods that rely on optimization of the eye closure rather than minimizing TDECQ penalties directly. The TDECQ penalty will be greater than or equal to the value reported using the 121.8.5 optimization method.

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Reviewed the presentation
https://www.ieee802.org/3/db/public/adhoc/presentations/le_cheminant_3db_adhoc_01a_042822.pdf.

There was consensus that alternative methods for calculating TDECQ such as MMSE should be noted in Clause 167. Add the following text as a new paragraph after the list of exceptions to the TDECQ measurement in 167.8.6.

"The lowest measured TDECQ values are achieved with the equalizer optimization method described in 121.8.5. Alternative optimization methods such as minimum mean squared error (MMSE) may be used to determine equalizer tap weights to reduce test time, and are expected to report equal or higher values of TDECQ. These alternative methods should not be used for receiver sensitivity and stressed receiver sensitivity calibration."