Cl **1** SC **1.3** P **57** L **17** # 88

Ran, Adee
Cisco Systems

Comment Type **T** *Comment Status* **X**

To my best knowledge, an SFP224 specification has not been made available for review of P802.3dj prior to the January meeting.
The editor's notes here and in Annex 179C were placed under certain project schedule assumptions. Based on the progress of the project, it may be possible to extend the deadline.

Assuming the deadline is not extended, all content related to SFP224 needs to be removed prior to SA ballot.

SuggestedRemedy

Change the note to extend the deadline to March 2026.
Alternatively:
Delete subclause 179.2.1, the editor's note in 1.3 about SFF-TA-1031, and all text and table columns/rows related to SFF224 across clause 179, annex 179C, and annex 179D, with editorial license.

Proposed Response *Response Status* **O**

Cl **1** SC **1.3** P **57** L **17** # 89

Ran, Adee
Cisco Systems

Comment Type **T** *Comment Status* **X**

To my best knowledge, an SFP-DD224 specification has not been made available for review of P802.3dj prior to the January meeting.
The editor's note in Annex 179C was placed under certain project schedule assumptions. Based on the progress of the project, it may be possible to extend the deadline.

Assuming the deadline is not extended, all content related to SFP-DD224 needs to be removed prior to SA ballot.

SuggestedRemedy

Change the note to extend the deadline to March 2026.
Alternatively:
Delete subclause 179.2.2 and all text and table columns/rows related to SFP-DD224 across clause 179, annex 179C, and annex 179D, with editorial license.

Proposed Response *Response Status* **O**

Cl **45** SC **2** P **109** L # 140

Fuller, Paul
Infineon

Comment Type **E** *Comment Status* **X**

This might be extremely picky, but degrade and degraded is used almost interchangeably throughout the document. It seems like degraded is the appropriate usage?

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **45** SC **45.2.1.269** P **121** L **8** # 22

Huber, Thomas
Nokia

Comment Type **ER** *Comment Status* **X**

In table 45-212r, the name of bit 1.2733.15 was changed from Lane 31 to Lane 27, but it should still be Lane 31.

SuggestedRemedy

Change the name back to "Lane 31 aligned."

Proposed Response *Response Status* **O**

Cl **73A** SC **73A** P **724** L **24** # 32

Huber, Thomas
Nokia

Comment Type **E** *Comment Status* **X**

"If the PMD is compliant to more than
one host class, the recommended priority of which host class to indicate would be HL followed by HN. So for example, HL would be advertised if the PMD supports all three host classes" is ambiguous and verbose. The intent seems to be that the highest-numbered class to which a PMD is compliant is what is advertised, so the text should simply say that.

SuggestedRemedy

Change
"If the PMD is compliant to more than
one host class, the recommended priority of which host class to indicate would be HL followed by HN. So for example, HL would be advertised if the PMD supports all three host classes"
to
"If the PMD is compliant to more than one host class, it shall indicate the highest-numbered class to which it complies."

Proposed Response *Response Status* **O**

Cl **73A** *SC* **73A.1a** *P* **723** *L* **40** # 147

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **X**

Message code 2 is known as the "Extended FEC and Technology Message code" not the "Technology Ability and FEC Extension" Message code.

SuggestedRemedy

Change "Technology Ability and FEC Extension" to "Extended FEC and Technology Ability" in the 2nd sentence

Proposed Response *Response Status* **O**

Cl **116** *SC* **116.3.2** *P* **171** *L* **40** # 23

Huber, Thomas — Nokia

Comment Type **ER** *Comment Status* **X**

The text of item b) was changed, replacing "DTE 200GXS, DTE 400GXS" with "DTE 800GXS".

SuggestedRemedy

Since this clause is about 200G and 400G PHYs, the change should be reverted. Change "DTE 800GXS" back to "DTE 200GXS, DTE 400GXS"

Proposed Response *Response Status* **O**

Cl **174A** *SC* **174A.10.5** *P* **751** *L* **42** # 106

Dudek, Mike — Marvell

Comment Type **TR** *Comment Status* **X**

An LR1 PMD (the subject of 174A.10) can be used with AUIs and therefore should use the codeword error ratio limit appropriate for a PMD not a PCS to PCS link. (Also 174A.6 is titled PCS to PCS not PHY to PHY path. PHY ro PHY path is not described in 174A.6. Also this section does not call out the BERadded.

SuggestedRemedy

Replace "The expected BLER is met if the measured value is less than the codeword error ratio limit specified in 174A.6 for a PHY-to-PHY path" with "The expected BLER is met if the measured value is less than the codeword error ratio limit specified in 185.2"

Consider deleting the whole section 174A.10, or replacing it with just a single paragraph (no subsections). "The test methods for an ISL (see 178B.3) with 800 Gb/s per lane signaling between a pair of 800GBASE-LR1 Inner FEC sublayers including a PMD and Inner FEC at each end and the medium between use the tests defined in 174A.9 with p=1.

Proposed Response *Response Status* **O**

Cl **175** *SC* **175.2.5.3** *P* **298** *L* **32** # 3

Maniloff, Eric — Ciena

Comment Type **TR** *Comment Status* **X**

Currently hi_ser is defined as being calculated based on the number of symbol errors detected in consecutive non-overlapping blocks of 8192 codewords for 1.6TBASE-R.

In 400GbE, hi_ser was based on 8192 codewords. In 800GbE, hi_ser was based on 8192 codewords per 400G flow with the output of the two flows OR'd to report hi_ser. 100GE and 200GE hi_ser is calculated over 2 AM periods. For 400GbE & 800GbE the interval for measurement is equal to an AM period, hence no counter is required. 100GbE and 200GbE have hi_ser intervals = 2 times the AM period.

Currently 1.6TbE has changed the interval to be less than the AM period. The hi_ser measurement window should be aligned with an AM period, this will maintain the 104.8576 µs time interval used in previous the PCS of 400 & 800GbE.

SuggestedRemedy

Two resolutions are possible:

Option 1: Change the hi_ser measurement interval to 32768 codewords (4x8192) to be consistent with the AM period, with the threshold for declaring hi_ser scaled by a factor of 4.

Option 2: Follow the approach of 800GbE, and calculate hi_ser individually in each FEC decoder over 8192 codewords with the results OR'd.

Proposed Response *Response Status* **O**

Cl **176** *SC* **176.4.2.2** *P* **322** *L* **27** # 90

Ran, Adee — Cisco Systems

Comment Type **E** *Comment Status* **X**

A single exception does not require a list (there are many such exceptions in the draft without a list).

SuggestedRemedy

Merge the list into the preceding paragraph, with editorial license.

Proposed Response *Response Status* **O**

Cl **176** *SC* **176.4.4.2** *P* **332** *L* **35** # 91

Ran, Adee Cisco Systems

Comment Type **E** *Comment Status* **X**

The subclause text includes a dashed list with one item, and then a paragraph with multiple statements regarding different PMAs, which would be more readable as a table or a list.

The suggested remedy is one way of improving this text, using a table. Other ways may be considered.

SuggestedRemedy

Use the following content, with editorial license:
The 200GBASE-R 8:1, 400GBASE-R 16:2, 800GBASE-R 32:4, and 1.6TBASE-R 16:8 PMAs use the alignment marker lock state diagram from Clause 119 (Figure 119-12), with the definitions of variables in 176.4.4.2.1, functions in 176.4.4.2.2, and counters in 176.4.4.2.3. Table 176-<new> lists the locations of additional variable definitions and values, and the values of the index x, which denotes the PMA service interface lane number.

Add a new table 176-<new> with columns for PMA type, reference clause for variables, and the range of x.

Proposed Response *Response Status* **O**

Cl **176** *SC* **176.7.4.6** *P* **342** *L* **37** # 92

Ran, Adee Cisco Systems

Comment Type **T** *Comment Status* **X**

The square wave test pattern defined in 120.5.11.2.4 has a period of 16 UI (8 threes and 8 zeros) since its introduction in 802.3bs (where the PAM4 signaling rate f_b was about 26 GBd for most interfaces). This corresponds to a fundamental frequency of f_b/16,

For the electrical and IM-DD optical interfaces defined in this amendment, this frequency is about 6.64 GHz (or slightly higher with inner FEC). It is expected that the accessible test points (e.g. TP2) will be after non-negligible loss at this frequency, and thus the amplitude to the output will be much lower than the steady-state levels, and there will be no flat regions, as expected from this pattern.

A longer-period square wave will be beneficial and will likely available in all implementations. Since the generator is optional, there is no harm in modifying the definition.

SuggestedRemedy

Add an exception that the number of consecutive zero and three symbols in the test pattern may be larger than 8, and a recommendation to provide a pattern with 16 or 32 consecutive symbols of each type.
Consider adding a variable and MDIO mapping to control the length of the pattern.
Implement with editorial license.

Proposed Response *Response Status* **O**

Cl **176C** *SC* **176C.3** *P* **796** *L* **48** # 104

Dudek, Mike Marvell

Comment Type **T** *Comment Status* **X**

The C2C spec normatively requires meeting the functional specifications in management variable specifications in 178.13 which point to those in 179.14 where PMD_reset is required. It would be more appropriate to call out PMA_reset

SuggestedRemedy

Add an exception. Change "and the management variable specifications in 178.13, unless stated otherwise" to "and the management variable specifications in 178.13,unless stated otherwise but with PMA_reset replacing PMD_reset. "
Make the same change in 176D on page 819 line19

Proposed Response *Response Status* **O**

Cl **176C** *SC* **176C.6.3** *P* **800** *L* **16** # 145

Kutscher, Noam Marvell

Comment Type **T** *Comment Status* **X**

The coefficients values under 'Transmitter Output equalization' section are different from the C2M, KR and CR - I think they need to be the same

SuggestedRemedy

Change the values to be consistent with CR, KR and C2C

Proposed Response *Response Status* **O**

Cl **176C** *SC* **176C.6.3.6** *P* **801** *L* **25** # 33

Huber, Thomas Nokia

Comment Type **E** *Comment Status* **X**

"different linear fit pulse peak ratio" should be "difference…"

SuggestedRemedy

Change "different" to "difference"

Proposed Response *Response Status* **O**

Cl **176C** *SC* **176C.6.4.5** *P* **806** *L* **13** # 20

Kutscher, Noam Marvell

Comment Type **T** *Comment Status* **X**

there is no target for COM on Test L

SuggestedRemedy

Add 3dB COM target for test L

Proposed Response *Response Status* **O**

Cl **176C** *SC* **176C.6.4.7** *P* **808** *L* **42** # 96

Dudek, Mike Marvell

Comment Type **TR** *Comment Status* **X**

An AUI link is PMA to PMA and doesn't include the major source of BER. Hence testing the AUI within a complete PHY rather than from the PMA to PMA will be difficult. Also FEC counters which operate over multiple lanes will make it even more difficult.

SuggestedRemedy

Delete "or 174A.11" also in 176D.8.15 page838 line 20

Proposed Response *Response Status* **O**

Cl **176C** *SC* **176C.7.1** *P* **812** *L* **18** # 134

Ghiasi, Ali Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

Nfix<j is confusing

SuggestedRemedy

Better written j>Nfix two instances

Proposed Response *Response Status* **O**

Cl **176D** *SC* **176D.3** *P* **819** *L* **38** # 57

Healey, Adam Broadcom, Inc.

Comment Type **E** *Comment Status* **X**

In Figure 176D-2, the delineation between host and module is shown to be the outer edge of the box labeled "connector". However, in Figures 176D-4 and 176D-5, the host and module are shown to extend to the line in the middle of a simlar looking "connector" box. Figure 176D-2 should be changed to be consistent with the other figures.

SuggestedRemedy

In Figure 176D-2, move the point where the arrows delineating "host" and "module" meet to align with the line in the middle of the box labelled "connector". If there is ambiguity about what this line represents, add a note to the figure indicating that the line corresponds to the "mating point of the MDI connector" similar to what is described in 179B.2.1 and 179B.3.1.

Proposed Response *Response Status* **O**

Cl **176D** *SC* **176D.6.1** *P* **821** *L* **35** # 19

Kutscher, Noam — Marvell

Comment Type **T** *Comment Status* **X**

There is no DC blocker on the test setup of the host figure - TX as well as RX paths + no description of the DC block on the host input. The module connected in the host TX and RX path has dc blockers(page 819) allowing the host device to operate at it's own voltages, we should add the DC blockers also in the host TX and RX test setup to allow the same conditions.

SuggestedRemedy

Add DC blocker between the HCB and the Tp1a and Tp4a + definition in 176D.6.6 host input - as done on176D.6.4 line 50, on the right of the HCB

Proposed Response *Response Status* **O**

Cl **176D** *SC* **176D.6.5** *P* **824** *L* **25** # 60

Healey, Adam — Broadcom, Inc.

Comment Type **TR** *Comment Status* **X**

Slide 7 of <https://www.ieee802.org/3/dj/public/25_11/healey_3dj_01a_2511.pdf> highlighted that there is some ambiguity in the loss that has been allocated to the module. The value computed on slide 12 for module output Rpeak was based on the more generous interpretation i.e., 5.9 dB from the TP4d to the mating point of the connector. If the loss from TP4d to the mating point of the connector is limited to 3.8 dB as shown in Figure 176D-6, then the Rpeak limit in Table 176D-3 needs to be adjusted.

SuggestedRemedy

If the module loss allocation is limited to 3.8 dB, then in Table 176D-3 change Rpeak (min) to 0.51 and change the lower value of the vf range to 0.392.

Proposed Response *Response Status* **O**

Cl **176D** *SC* **176D.7.2** *P* **827** *L* **26** # 136

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

Devcie package model missing class type

SuggestedRemedy

Update the table as following:
Pacakge on page 822. line 30 add Host Class B

Proposed Response *Response Status* **O**

Cl **176D** *SC* **176D.7.2** *P* **827** *L* **41** # 138

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

Typical module implemenation will use mSAP where there is not 1st level pacakge and if some implementation uses a package for CDR it will be core-less

SuggestedRemedy

Add note to "Device pacakge model, module"
Note. If module PMA/CDR function doesn't use 1st level package then replace module pacakge with the null package.

Proposed Response *Response Status* **O**

Cl **176D** *SC* **176D.7.2** *P* **827** *L* **49** # 139

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

If an implementation has a 1st level package then it will be a core-less pacakge and RDL via through the substrate will be <<1.8 mm

SuggestedRemedy

Replace 1.8 mm transmission line length 2 with 0.2 mm

Proposed Response *Response Status* **O**

Cl **176D** *SC* **176D.7.2** *P* **828** *L* **5** # 137

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

Partial host channel model in the table not clear is needed or for what is the purpose!

SuggestedRemedy

Either descibe the purpose of partial host channel otherwise remove it

Proposed Response *Response Status* **O**

Cl **176D** *SC* **176D.7.2** *P* **829** *L* **42** # 135

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

Nfix<j is confusing

SuggestedRemedy

Better written j>Nfix two instances

Proposed Response *Response Status* **O**

Cl **176D** *SC* **176D.8.8** *P* **832** *L* **8** # 59

Healey, Adam — Broadcom, Inc.

Comment Type **E** *Comment Status* **X**

The first letter in the subclause heading should be capitalized.

SuggestedRemedy

Change the subclause heading to "Signal-to-noise-and-distortion ratio".

Proposed Response *Response Status* **O**

Cl **176D** *SC* **176D.8.12** *P* **833** *L* **21** # 48

Brown, Matt — Alphawave Semi

Comment Type **E** *Comment Status* **X**

BER should be BER_max to align with similar tables elsewhere and with Annex 174A.9.5, 174A.9.6, etc.

SuggestedRemedy

Change "BER" to "BER_max".

Proposed Response *Response Status* **O**

Cl **176D** *SC* **176D.8.13.2** *P* **836** *L* **9** # 58

Healey, Adam — Broadcom, Inc.

Comment Type **TR** *Comment Status* **X**

For the module receiver interference tolerance test, item b) states that "COM is calculated using the module device package and device termination models". However, the module test channel shown in Figure 176D-8b includes the host compliance board (HCB). The reference loss of the HCB equals the module loss allocation to TP1d illustrated in Figure 176D-6. Therefore, the addition of the module device package model results in the interference tolerance test being calibrated with approximately 2.1 dB more loss than a module has been allocated.

SuggestedRemedy

Replace 176D.8.13.2 item b) with the following. "For the module test, the test channel is measured between the Tx and Rx test references shown in Figure 176D-8b, and COM is calculated using device termination model in Table 176D–6 for the receiver S-parameter model."

Proposed Response *Response Status* **O**

Cl **177** *SC* **177.4.5** *P* **360** *L* **33** # 6

Bruckman, Leon — Nvidia

Comment Type **TR** *Comment Status* **X**

Text: "The addition operation inside the matrix multiplication is an XOR operation." is not clear where is the matrix multiplication ? Needs a reference to an equation

SuggestedRemedy

Change: "The addition operation inside the matrix multiplication is an XOR operation."
To: "The addition operation in Equation 177-3 is a XOR operation."

Proposed Response *Response Status* **O**

Cl **177** *SC* **177.5.5** *P* **366** *L* **20** # 148

Slavick, Jeff — Broadcom

Comment Type **T** *Comment Status* **X**

The statement that the counters are mapped to management variables is specified in 177.10 shouldn't be part of the definition of the corrected_cw_counter but rather a global statement in 177.5.5

SuggestedRemedy

Move "Mapping of counters to management variables is specified in 177.10." to be its own paragraph at the very end of 177.5.5.

Proposed Response *Response Status* **O**

Cl **177** *SC* **177.5.5** *P* **366** *L* **43** # 150

Slavick, Jeff — Broadcom

Comment Type **TR** *Comment Status* **X**

The definition of the error_bin calls for the bin to contain CW with k bits "corrected". I believe the intent is that error bin 0 is to count CW received with 0 errors in them. However, an uncorrected CW could also have 0 corrected bits as the decoder couldn't figure out what to do and thus changed nothing.
I believe we want corrected_cw + uncorrected_cw + error_bin_0 = cw_counter. And that error_bin_1 + error_bin_2 + error_bin_3 = corrected_cw.
So we should explicIty call out that error_bin_0 is a CW received with 0 errors.

SuggestedRemedy

In 177.5.5 and 184.5.7 add the following to the definition of Inner_FEC_codeword_error_bin_k:

Error bin 0 increments when the Inner FEC codeword contains no detected bits in error.

Proposed Response *Response Status* **O**

Cl **178** *SC* **178.8.10** *P* **389** *L* **37** # 7

Bruckman, Leon — Nvidia

Comment Type **TR** *Comment Status* **X**

The PMD reset, resets also the RTS function as shown in Figure 178B-9. See also the reset variable definition in 178B.8.2.1.

SuggestedRemedy

Change: "PMD reset shall reset the inter-sublayer link training (ILT) and ready-to-send (RTS) functions associated with the PMD"

Proposed Response *Response Status* **O**

Cl **178** *SC* **178.9.2** *P* **390** *L* **24** # 40

Mellitz, Richard — Samtec

Comment Type **TR** *Comment Status* **X**

RLcc is not a reliable interoperability metric and should be removed from specifications because it often causes many false pass and false fail results. See “Impact of Modal ERL on COM”, by Mellitz for the IEEE P802.3dj January 2026 task Interim force meeting for more information.
RLcc It is better suited as a design tool, while SCMR and RLdc/RLcd are more effective indicators of common-mode issues.

SuggestedRemedy

Remove RLcc rows in the Tx specification tables
178.9.2: Table 178-6: page 390: line 24
179.9.4: Table 179-7: page 425: line 47
176C.6.3: Table 176C-2: page 800: line 8
176D.6.4: Table 176D-2: page 823: line 18
176D.6.5; Table 176D-3: page 824: line 20

Remove RLcc rows in the specification tables
179.11: Table 179-16: page 445: line 18□

Remove sections for common-mode to common mode RL
178.9.2.4: Page 393: line 20
179.9.4.9: Page 434: line 28

Remove section 176D.8.4 Return loss specifications.

Proposed Response *Response Status* **O**

Cl **178** *SC* **178.9.2.3** *P* **392** *L* **38** # 47

Brown, Matt — Alphawave Semi

Comment Type **T** *Comment Status* **X**

The specification is for transmitter ERL.

SuggestedRemedy

Change "receiver package class" to "transmitter package class".

Proposed Response *Response Status* **O**

Cl **178** *SC* **178.9.2.5** *P* **393** *L* **27** # 24

Huber, Thomas — Nokia

Comment Type **E** *Comment Status* **X**

"different linear fit pulse peak ratio" should be "difference…"

SuggestedRemedy

Change "different" to "difference"

Proposed Response *Response Status* **O**

Cl **178** *SC* **178.9.2.6** *P* **394** *L* **2** # 56

Healey, Adam — Broadcom, Inc.

Comment Type **ER** *Comment Status* **X**

VCM_FB is defined to be "the full-band peak-to-peak AC common-mode voltage defined by the method specified in 179.9.4.2". 179.9.4.2 defines "Transmitter output equalization".

SuggestedRemedy

Change the reference from 179.9.4.2 to 176D.8.2.

Proposed Response *Response Status* **O**

Cl **178** *SC* **178.9.3** *P* **395** *L* **13** # 41

Mellitz, Richard — Samtec

Comment Type **TR** *Comment Status* **X**

RLcd is specified in table 178-9 and other similar tables is not sufficient to control impairments from common mode reflections.
RLcd and RLdc exhibit complex interactions across the transmitter, receiver, and channel, as mode-conversion reflections arise from multiple interacting reflection paths that are not represented by simple reflection diagrams.
Both RLcd and RLdc are required for transmitters, receiver, and channels and should be universally specified to account for mode reflection impairment. This comment will only address where RLcd or RLdc are specified.
Furthermore, limiting RLcd or RLdc with frequency-domain RL masks don't capture the time-domain nature of reflections. ERLcd and ERLdc are better suited for control modal impair as suggested in "Impact of Modal ERL on COM", by Mellitz for the IEEE P802.3dj January 2026 task Interim force meeting.

SuggestedRemedy

Remove RLcd and RLcd masks and respective sections and replace them with minimum specification limits of 17 dB for ERLcd and ERLcd. See "Impact of Modal ERL on COM", by Mellitz for the IEEE P802.3dj January 2026 task Interim force meeting for more
Add section derived from 93A.5 but change reference from return loss to modal return loss.
Refer to the 10-30-2025 electrical ad-hoc presentation by mellitz "Moving toward an ERL CC, DC, and CC specification" (mellitz_3dj_01_adhoc_251030)

Summary in "Impact of Modal ERL on COM", by Mellitz for the IEEE P802.3dj January 2026 task Interim force meeting
Details ------

-Remove RLcd rows in the Rx specification tables
178.9.2: Table 178-9: page 395: line 13
-Remove section: 178.9.3.8
-Replace with 2 rows: ERLcd (min) and ERL_dc (min) of 17 dB using ERL parameter specified in 178.9.3.7

-Remove RLcd rows in the channel specification tables
- 178.10.21 Table 178-13: page 402: line 11
-Remove section. 178.10.4
-Replace with 2 rows: ERLcd (min) and ERL_dc (min) of 17 dB using ERL parameter specified in 178.10.3

-Remove RLcd rows in the cable assembly specification tables
- 179.11 Table 179-16: page 445: line 16
-Remove section. 179.11.4
-Replace with 2 rows: ERLcd (min) and ERL_dc (min) of 17 dB using ERL parameter specified in 178.11.3

-Remove RLcd rows in the Rx specification tables
- 179.11 Table 176C-4: page 803: line 13

-Remove section. 176C.6.4.3
-Replace with 2 rows:ERLcd (min) and ERL_dc (min) of 17 dB using ERL parameter specified in 176C.6.4.2

-Remove RLcd rows in the channel specification tables
- 176C.7 Table 176C-8: page 809: line 17
-Replace with 2 rows: ERLcd (min) and ERL_dc (min) of 17 dB using ERL parameter specified in 178C.7.3

-Remove RLcd rows in the host input specification tables
176D.6.6: Table 176D-4: page 825: line 16
-Remove section: 178D.8.4
-Replace with 2 rows: ERLcd (min) and ERL_dc (min) of 17 dB using ERL parameter specified in 176D.8.3

-Remove RLcd rows in the Module input specification tables
176D.6.7: Table 176D-4: page 825: line 45
-Replace with 2 rows: ERLcd (min) and ERL_dc (min) of 17 dB using ERL parameter specified in 176D.8.3

-Remove RLdc rows in the Module input specification tables
179.9.4: Table 179-7: page 425: line 48
-Remove section: 179.9.4.10
-Replace with 2 rows: ERLcd (min) and ERL_dc (min) of 17 dB using ERL parameter specified in 179.9.4.8

-Remove RLdc rows in the Tx specification tables
176C.6.3: Table 176C-2: page 800: line 33
-Remove section: 176C.6.3.9
-Replace with 2 rows: ERLcd (min) and ERL_dc (min) of 17 dB using ERL parameter specified in 176C.6.3.7

-Remove RLdc rows in the host output specification tables
176D.6.4: Table 176D-2: page 823: line 20
-Remove section: 176D.8.4
-Replace with 2 rows: ERLcd (min) and ERL_dc (min) of 17 dB using ERL parameter specified in 176D.8.3

-Remove RLdc rows in the host output specification tables
176D.6.5: Table 176D-3: page 824: line 22
-Replace with 2 rows: ERLcd (min) and ERL_dc (min) of 17 dB using ERL parameter specified in 176D.8.3

Proposed Response *Response Status* **O**

Cl **178** *SC* **178.9.3.4.2** *P* **398** *L* **33** # 43

Brown, Matt Alphawave Semi

Comment Type **E** *Comment Status* **X**

The jitter parameter defined in 179.9.4.7.2 is JH4u, not J4Hu.

SuggestedRemedy

Change "J4Hu" to "JH4u" in 6 places.
178: page 398, line 33/35
176C: page 802 line 3, page 807 line 27/29

Proposed Response *Response Status* **O**

Cl **178** *SC* **178.9.3.5.2** *P* **399** *L* **45** # 95

Dudek, Mike Marvell

Comment Type **E** *Comment Status* **X**

Typically we say "measured at TP0v" not "measured at the TP0v"

SuggestedRemedy

Change to "measured at TP0v"

Proposed Response *Response Status* **O**

Cl **178** *SC* **178.10.1** *P* **405** *L* **15** # 132

Ghiasi, Ali Ghiasi Qunatum/Marvell

Comment Type **ER** *Comment Status* **X**

Nfix<j is confusing

SuggestedRemedy

Better written j>Nfix two instances

Proposed Response *Response Status* **O**

Cl **178** *SC* **178.10.6** *P* **407** *L* # 42

Mellitz, Richard — Samtec

Comment Type **TR** *Comment Status* **X**

SCMR for device transmitters accounts for all common-mode effects, including power noise, thermal noise, and non-linear noise, which can indicate that the common mode is uncorrelated and unbounded. However, SCMR_CH is a correlated and bounded metric. It is a channel-specific property closely related to COM. The statical criterion of the SCMR_CH computation P_peak should be applied in a comparable manner to the COM computation.

SuggestedRemedy

178.10.6 page 407 line 36
Replace 10^-7 with DER0
179.11.7 page 451 line 46
Replace 10^-7 with DER0
176C.7.4 page 813 line 24
Replace 10^-7 with DER0

Proposed Response *Response Status* **O**

Cl **178A** *SC* **178A.1.7.3** *P* **854** *L* **20** # 39

Mellitz, Richard — Samtec

Comment Type **TR** *Comment Status* **X**

Equation 179A-19 for S_tn computation omits the modulation term (signa_X²), assuming transmitter noise behavior is independent of modulation. This was implemented as are result of comment 511 on d1.3. This is acceptable for low-radix designs with minimal crosstalk, where SNDR remains high regardless of modulation. However, in high-radix designs with significant crosstalk and modal conversion, transmitter noise becomes modulation-dependent. Ignoring signa_X² under these conditions misrepresents performance and introduces a ~0.4 dB COM penalty.

SuggestedRemedy

Include signa_X^2 in the S_tn computation as in suggested in slide 7 of https://www.ieee802.org/3/dj/public/24_01/healey_3dj_01_2401.pdf

Proposed Response *Response Status* **O**

Cl **178A** *SC* **178A.1.8.1** *P* **857** *L* **49** # 155

Mi, Guangcan — Huawei Technologies Co., Ltd.

Comment Type **T** *Comment Status* **X**

In euqation 178-20, variable d_h was used but not defined.

SuggestedRemedy

Add definition of d_h.

Proposed Response *Response Status* **O**

Cl **178B** *SC* **178B.8.3.5** *P* **889** *L* **43** # 146

Maki, Jeffery — Hewlett Packard Enterprise

Comment Type **TR** *Comment Status* **X**

Follow-up to comment #291 against D2.2.
The peer-end (far-end) electrical interface (AUI component) can cause the near-end electrical interface (AUI component) to do E1 retraining. There are no exit conditions from the “PATH_UP” state defined in Figure 178B–10—Training control state diagram to cover any alternative to avoid complete retraining of all ISLs in the path since only MR_Restart is available.

SuggestedRemedy

Affirm that recovery from fault conditions always requires retraining of all ISLs such as near-end E1, O1, and peer-end E1. Alternatively, define the exit conditions from the “PATH_UP” state in the Training control state diagram to avoid complete retraining across the entire path for consistent behavior so vendor/user-specific implementations do not lead to a lack of interoperability.

Proposed Response *Response Status* **O**

Cl **178B** *SC* **178B.8.3.5** *P* **893** *L* **30** # 5

Lusted, Kent — Synopsys

Comment Type **T** *Comment Status* **X**

In the RX_READY box of Figure 178B-10, the assignment of tx_disable is incorrect. The current text is "tx_disable <= local_rts" and should be "tx_disable <= !local_rts".

The resolution to D2.2 comment #222 contains "Implement the proposed changes on slide 19 of brown_3dj_03b_2511" in which the text for the RX_READY box is "tx_disable <= !local_rts".

SuggestedRemedy

In the RX_READY box of Figure 178B-10 change "tx_disable <= local_rts" to "tx_disable <= !local_rts".

Proposed Response *Response Status* **O**

Cl **178B** *SC* **178B.8.3.5** *P* **893** *L* **53** # 21

GALAN, JOSE — MAXLINEAR, INC.

Comment Type **TR** *Comment Status* **X**

In the PATH_UP state, when transitioning to data mode and tx_mode is set to data (tx_mode <-- data), this means the Tx starts transmitting data from the PMA or Inner FEC if the Inner FEC is available. But the Inner FEC encoder can start only after the Rx achieves the alignment marker lock. It would be good to clarify that in the PATH_UP state the data mode starts after the alignment marker detection.

SuggestedRemedy

Add text clarifying that in the PATH_UP state the transition to data mode (tx_mode <-- data) can only start after alignment marker detection and the Rx is locked.

Proposed Response *Response Status* **O**

Cl **178B** *SC* **178B.9** *P* **895** *L* **51** # 99

Dudek, Mike — Marvell

Comment Type **E** *Comment Status* **X**

In this subsection "other interface" is used which is not well defined whereas in the rest of the section "adjacent interface" is used for the same interface and "adjacent interface is better defined

SuggestedRemedy

Replace "other interface" with "adjacent interface" throughout this subsection. (4 places).

Proposed Response *Response Status* **O**

Cl **179** *SC* **179.8.4** *P* **423** *L* **24** # 8

Bruckman, Leon — Nvidia

Comment Type **TR** *Comment Status* **X**

The start up protocol was renamed APSU

SuggestedRemedy

Change: "of the ILT startup protocol"
To: "of the APSU startup protocol"

Proposed Response *Response Status* **O**

Cl **179** *SC* **179.8.4** *P* **423** *L* **25** # 25

Huber, Thomas — Nokia

Comment Type **E** *Comment Status* **X**

"ILT startup protocol" is confusing, given that the combination of ILT and RTS is named Autonomous Path Startup.

SuggestedRemedy

Change "ILT startup protocol" to "ILT function", if the intent is to refer to ILT being complete, or to "autonomous path startup function", if the intent is that ILT and RTS are complete.

Proposed Response *Response Status* **O**

Cl **179** *SC* **179.8.4** *P* **423** *L* **26** # 26

Huber, Thomas — Nokia

Comment Type **E** *Comment Status* **X**

"remote_rts in the ILT function (see 178B.8.2.1)" is confusing. The variable remote_rts is in the referenced clause, but the ILT function is defined in 178B.7

SuggestedRemedy

Replace "remote_rts in the ILT function (see 178B.8.2.1)" with "ILT function variable remote_rts (see 178B.8.2.1)"

Proposed Response *Response Status* **O**

Cl **179** *SC* **179.8.5** *P* **423** *L* **31** # 27

Huber, Thomas — Nokia

Comment Type **E** *Comment Status* **X**

"the variables local_rx_ready and remote_rx_ready in lane i of the ILT function" is confusing. Probably also useful to include a cross-reference to 178B.8.3.1, where these variables are defined.

SuggestedRemedy

Replace "the variables local_rx_ready and remote_rx_ready in lane i of the ILT function" with "the ILT function variables local_rx_ready and remote_rx_ready (see 178B.8.3.1) for lane i".

Proposed Response *Response Status* **O**

Cl **179** *SC* **179.8.7** *P* **423** *L* **48** # 28

Huber, Thomas — Nokia

Comment Type **E** *Comment Status* **X**

"the variable tx_disable in lane i of the ILT function (see 178B.8.2.1)" is confusing. The cross-reference is to the variable definition, not to the ILT function, which is defined in 178B.7.

SuggestedRemedy

Replace "tx_disable in lane i of the ILT function (see 178B.8.2.1)" with "ILT function variable tx_disable (see 178B.8.2.1) for lane i".

Proposed Response *Response Status* **O**

Cl **179** *SC* **179.9.4.7** *P* **432** *L* **11** # 105

Dudek, Mike — Marvell

Comment Type **TR** *Comment Status* **X**

With the change to using JH4u amplitude noise is no longer creating jitter therefore disabling the other lanes should not be done as any true phase noise introduced by the other lanes should be included.

SuggestedRemedy

Delete "JH4u and"

Proposed Response *Response Status* **O**

Cl **179** *SC* **179.9.4.7** *P* **432** *L* **11** # 141

Calvin, John — Keysight Technolgies

Comment Type **T** *Comment Status* **X**

Jrms needs to be added to the list which presently only includes JH4u and EOJ03.

SuggestedRemedy

Add Jrms after the JH4u as in "For JH4u, Jrms and EOJ03 measurements"

Proposed Response *Response Status* **O**

Cl **179** *SC* **179.9.4.7** *P* **432** *L* **17** # 142

Calvin, John — Keysight Technolgies

Comment Type **T** *Comment Status* **X**

Empirical measurments indicate physical clock recovery systems benefit from being able to lower PLL corner down from 4 MHz to 1 MHz, for reasons similar to those discussed in the 802.3ck project contribution
https://www.ieee802.org/3/ck/public/adhoc/sept16_20/calvin_3ck_adhoc_01_091620.pdf
The jitter decompositon for 106Gbd systems have very small margins and they are improved by offering an option on to reduce the loop BW.

SuggestedRemedy

In the paragraph at line 17 describing the PLL corder frequency at 4MHz. Consider this revised tex "Measurement is performed with a clock recovery unit (CRU) with a corner frequency of either 4 MHz or 1 MHz and a slope of 20 dB/decade."
The fact that lowering the loop BW from 4 to 1 MHz improves jitter is a little counter-intuitive and will likely require a contribution to make this point.

Proposed Response *Response Status* **O**

Cl **179** *SC* **179.9.4.7.1** *P* **432** *L* **23** # 143

Calvin, John — Keysight Technolgies

Comment Type **T** *Comment Status* **X**

The proposed text that follows the "using the methods described in this subclause" works well on oversampled acquisition architectures, not so well on undersampled systems (Equivalent Time /DCA platforms) The DCA architecture acquires data slower but can place samples strategically to model edges for jitter measurements. Characterizing the edges and the amplitude noise allows the DCA to back out a more exact amount of jitter from each edge, accounting for asymmetric edge shape around the thresholds.
This current text is too perscriptive and need to cited as an example method, not THE method.

SuggestedRemedy

Replace the text at line 23 from "using the method described in this subclause" to "An example method is described below." to suggest this is one of several methods to extract the phase only jitter content, and allow alternative methods better suited for different measurment technology.

Proposed Response *Response Status* **O**

Cl **179** *SC* **179.9.4.7.2** *P* **432** *L* **52** # 144

Calvin, John — Keysight Technolgies

Comment Type **T** *Comment Status* **X**

The method of jitter decompositon oulined in this this "using the method described in this subclause" has been proven effective but is not the only way. An alternate method better suited to Equivalent Time / DCA platforms undersampled acquisiton has been proven effective and equivalent in final result using a variation of this published method. The request here is for this to be a little less perscriptive and cites as an example method but not the only method.

SuggestedRemedy

Replace the text at line 52 from "using the method described in this subclause" to "An example method is described below." to suggest that variation on this POJ technique are also valid.

Proposed Response *Response Status* **O**

Cl **179** *SC* **179.10.1** *P* **450** *L* **15** # 133

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

Nfix<j is confusing

SuggestedRemedy

Better written j>Nfix two instances

Proposed Response *Response Status* **O**

Cl **179** *SC* **179.11.5** *P* **446** *L* **28** # 34

Heck, Howard — TE Connectivity

Comment Type **TR** *Comment Status* **X**

The RX RLcd mask requirement for CR that was adopted via D2.0 comment #492 is too stringent for cable assemblies to meet.

SuggestedRemedy

Change equation (179-27) and Figure 179-8 to
RLcd(f) = 28-15*f/12.89 for 0.01<=f<12.89 GHz
13-5*(f-12.89)/(35-12.89) for 12.89<=f<35 GHz
8 for 35 <=f <= 67 GHz
A contribution is planned for the January interim to support the comment and suggested remedy.

Proposed Response *Response Status* **O**

Cl **179** *SC* **179.11.6.2.2** *P* **451** *L* **23** # 93

Ran, Adee — Cisco Systems

Comment Type **E** *Comment Status* **X**

A single exception does not require a list (there are many such exceptions in the draft without a list).

SuggestedRemedy

Merge the list into the preceding paragraph, with editorial license.

Proposed Response *Response Status* **O**

Cl **179B** *SC* **179B.4.1** *P* **912** *L* **10** # 85

Ran, Adee — Cisco Systems

Comment Type **T** *Comment Status* **X**

The difference between minimum and maximum ILdd for mated test fixtures is about 3 dB at the Nyquist frequency.
This difference allows significant variations in cable assembly test fixture (MCB), which can have a double effect (up to 6 dB) if used to measure a cable.

SuggestedRemedy

Reduce the allowed variablility of test fixtures, or its effect on measurements.
A detailed proposal is planned.

Proposed Response *Response Status* **O**

Cl **179C** *SC* **179C.1** *P* **921** *L* **3** # 86

Ran, Adee — Cisco Systems

Comment Type **T** *Comment Status* **X**

"When an MDI connector is not fully utilized the lower PMD numbers in Table 179C–2 should be used"

The MDI is part of the PHY so "not fully utilized" means the host does not have transmit and receiver functions for all lanes of the MDI. This is an unlikely situation, and even if it happens, following the recommendation does not guarantee interoperability, since in most cases the link partner needs to be configured accordingly.

Instead, it would be helpful for readers to know that in some cases, such as breakout cables, the combination of PMDs types on both sides of the cable can require management to create matching configurations

SuggestedRemedy

Delete the quoted sentence.
Add the following informative note:
NOTE—The PMD types on both sides of the cable assembly need to match. When the MDI is used for multiple PMDs or for PMDs with lower number of lanes than the MDI supports, appropriate configuration is required. The means for selecting the appropriate configuration are beyond the scope of this standard.

Proposed Response *Response Status* **O**

Cl **179C** *SC* **179C.1** *P* **921** *L* **4** # 107

Dudek, Mike — Marvell

Comment Type **TR** *Comment Status* **X**

Annex 180A provides normative requirements for which fibers should be used when connectors are not fully utilized. Whereas for the equivalent situation for CR there is just a "recommendation" with the use of "should"

SuggestedRemedy

Change "When an MDI connector is not fully utilized the lower PMD numbers in Table 179C–2 should be used." to "When an MDI connector is not fully utilized the lower PMD numbers in Table 179C–2 shall be used". Or "When all the lanes of an MDI connector do not have signals connected the lower PMD numbers in Table 179C–2 shall be used.e.g. if a QSFP224 connector is used for a single 400GBASE-CR2 connection then PMD 0 and 1 are used."

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.7.1** *P* **470** *L* **34** # 54

Rodes, Roberto — Coherent

Comment Type **TR** *Comment Status* **X**

If TDECQCER better correlates with Rx Sensitivity, it should replace TDECQ for calculating link budget and OMA specs. However, TDECQCER does not combine samples of all 65k PAM4 symbols to create distribution but creates distributions for each PAM4 sample. This drastically reduces the number of samples available to create stable statistics.
Oscilloscope testing is better suited for traditional TDECQ and new TDECQCER.
Traditional TDECQ has shown good correlation for most cases.

SuggestedRemedy

Remove TDECQ CER from the spec. Do the same for CL 181, 182 and 183

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.7.1** *P* **470** *L* **38** # 108

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

In D2.0 1T DFE was added to the TDECQ equalizer which reduces the need for transmiteer overshoot where TDECQ doesn't capture peak-to-average ratio and may result in BER degradation with improving TDECQ.

SuggestedRemedy

Reduce transmitter overshoot from 22% to 12% or alternatively incorporate overshoot penalty assuming ENOB of 6 bits into TDECQ
see ghiasi_3dj_01_2601 also see unsatisfied comment

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.1** *P* **477** *L* **38** # 53

Rodes, Roberto — Coherent

Comment Type **E** *Comment Status* **X**

make TDECQ CER name consistent with the other tables in the clause

SuggestedRemedy

make TDECQ CER naming consistent in table 180-14 and table 180-7

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.2** *P* **478** *L* **10** # 112

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

With TDECQ expected to capture jitter more accuratly now that explicit jitter measurmeent are removed the CRU maximum peaking must be defined, also the slope should be -20 dB not 20 dB.

SuggestedRemedy

Origonal text: The clock recovery unit (CRU) has a corner frequency of 4 MHz and a slope of 20 dB/decade.
proposed text: The clock recovery unit (CRU) has a 3 dB corner frequency of 4 MHz and a slope of -20 dB/decade. The CRU maximum jitter transfer peak is ≤0.3 dB from 40 kHz to 20 MHz.

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.5** *P* **478** *L* **43** # 94

Ran, Adee — Cisco Systems

Comment Type **T** *Comment Status* **X**

"OMAouter is measured using the waveforms captured at the output of the reference receiver defined in 180.9.2"
As noted in previous comments, the illustration of the signal in Figure 180-8 does not match this statement; the signal in the figure is fully equalized. Indeed, in a non-equalized signal, there will likely be no flat region in a 6-UI run (noting that the reference equalizer is longer).

In another comment I am suggesting that the reference equalizer should be normalized to have c(0)=1. With this modification, the nominal 0 and 3 levels will be the same before and after the equalizer, but the eye diagram will be open, and thus OMA_outer will be measurable at the equalizer output on flat regions. This will also match the illustration in Figure 180-8.

The benefit of these two changes is that OMA_outer matches the original meaning of the distance between nominal levels measured without equalization (e.g. with an NRZ modulated pattern). Also, there is no need for two different definitions of OMA.

SuggestedRemedy

Change "at the output of the reference receiver defined in 180.9.2" to "at the output of the reference equalizer defined in 180.9.6.3".
Apply corresponding changes in clauses 181, 182, and 183.
A detailed proposal is planned.

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.6** *P* **479** *L* **25** # 124

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

802.3dj has spend last 1 year to best capture jitter in TDECQ and FRx, unless xAUI-n (C2M) interface operate with jitter tolerance condition in 176D.8.14 TDECQ measurement maybe be too optimistic see also unsatisfied comment 147 D2.2

SuggestedRemedy

Add sentence on 46: For thoes cases there is a xAUI-n chipto-module (C2M) interface TDECQ must be met with Module stressed input condition in 176D.8.14 for 200 Gb/s AUI and in 120E.3.4.1 for 100 Gb/s AUI.
See ghiasi_3dj_02_2601

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.6.3** *P* **481** *L* **3** # 61

Ran, Adee
Cisco Systems

Comment Type **TR** *Comment Status* **X**

The reference equalizer is defined here without any statement of how the coefficients are calculated.
Different coefficients will yield different values of the metric being calculated.

The same reference equalizer is used for TDECQ (180.9.6), TDECQ_SER (180.9.7), TECQ (180.9.8), and SRS (180.9.16, for SECQ), and the optimal coefficients can be different in each case. This is not stated anywhere.

Note that a method of optimization is described in the 4th paragraph of 180.9.6.4 (identical to the original definition in 121.8.5.3), albeit being phrased as an example ("one way of doing this"). This method is specific to TDECQ - other metrics do not have equivalent statements, but there is no reason that TECQ (as an example) will use the same equalizer as TDECQ. It should be explicitly stated that the equalizer can be different.

Note that 181.9.7, 182.9.7, and 183.9.7 state that the "optimized parameters" are taken from TDECQ measurement - which has no equivalent in clause 180. There should be no requirement to use the same parameters.

SuggestedRemedy

In 180.9.7, add an informative note after the second paragraph:
"NOTE—The coefficients of the reference equalizer that yield the minimum TDECQ_CER can be different from those of TDECQ in 180.9.6.4."

In 180.9.8, add a similar informative note for TECQ.

Make similar changes in corresponding subclauses of clauses 181, 182, 183, and specifically, remove the requirement to use the same "optimized parameters" for TDECQ_CER.

Implement with editorial license.

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.6.3** *P* **482** *L* **17** # 35

El-Chayeb, Ahmad
Keysight (ahmad.el-chayeb@keysight.com)

Comment Type **TR** *Comment Status* **X**

Including the DFE tap b1 in the limit: |w(1)/w(0)-b(1)-w(-1)/(w0)| <= .25 makes the implementation makes the limit non-linear limit, introduces complexity and increases the measurement time.

SuggestedRemedy

A supporting presentation will be provided.

Suggested remedy: Remove b(1) from the equation

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.6.3** *P* **482** *L* **23** # 62

Ran, Adee — Cisco Systems

Comment Type **T** *Comment Status* **X**

Footnote a (attached to the "Equalizer DC gain" row) says "The sum of all 15 equalizer coefficients, w(i)."

The DC gain is the response to an infinite run of identical symbols (with a certain nominal level) at the input, divided by that level. When the equalizer consists of only an FFE, it is indeed the sum of the coefficients. But with the DFE (which subtracts the nominal symbol level from the output) the sum of the FFE taps is no longer the DC gain. If the sum of w(i) is set to 1 then the DC gain will be 1-b(1).

However, "unity DC gain" is an arbitrary choice and perhaps not the best requirement.

Since the reference equalizer is long, it is likely to address not just limited bandwidth but also frequency ripple (e.g. reflections). In this case it is preferable to normalize the equalizer in a different way, to maintain the nominal levels equal before and after the equalizer; This requires that the normalization is to have w(0)=1 instead.
(rationale: in convolution of the equalizer and the pulse response, w(0) is multiplied by the nominal level of the symbol x(n)*h(0), creating the four levels of the eye diagram; other coefficients are multiplied by previous or subsequent symbols x(n+k)h(n-k+i); these terms have zero mean because the symbols are uncorrelated and equiprobable).

This would enable measuring OMA at the equalizer output and having only one definition of OMA.

A related change in the calculation of OMA_outer is suggested in another comment.

Note that this change does not affect TDECQ because the noise amplification is calculated from the equalizer's response, which is scaled by the same factor.

SuggestedRemedy

Add limits for i=0: min=1, max=1.
Change the "symbol" for limits to w(i) (no need to divide by w(0) since it is 1).
Delete the row for "Equalizer DC gain" and the footnote.
In equation 180-10, delete the middle term "H_eq(f=0)=" (the DC gain), because it is not equal to 1 anymore.

Delete the definition of OMA_TDECQ and change all instances of "OMA_TDECQ" to "OMA_outer".

Apply corresponding changes in clauses 181, 182, and 183.
A detailed proposal is planned.

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.6.4** *P* **482** *L* **33** # 49

Rodes, Roberto — Coherent

Comment Type **T** *Comment Status* **X**

It is unclear from the method description whether the oscilloscope is intended to capture and process only a single pattern acquisition or whether it can accumulate multiple pattern acquisitions.

SuggestedRemedy

Replace “...the oscilloscope is set up to capture samples from all symbols in the complete pattern...” with “...the oscilloscope is set up to capture samples from all symbols with a single pattern acquisition...”

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.6.4** *P* **482** *L* **53** # 46

Brown, Matt — Alphawave Semi

Comment Type **T** *Comment Status* **X**

In the sentence "The TDECQ reference point where OMATDECQ is referenced to and noise is added is at the input of the reference equalizer." it is not clear what these reference points are. Further, the measurement point for OMA_TDEQ contradicts the text on page 485 line 46 and 488 line 52. If these are intended to be the same point then one or the other locations needs to be corrected. If they are intended to be different, then a different parameter name should be used. Finally, the definition of OMA_TDECQ should be colocated where it is used, e.g., along with equation 180-1 through 180-3.

SuggestedRemedy

Reconcile the measurement points for OMA_TDECQ or use different parameter names.
Define OMA_TDECQ where it is referenced in equations, e.g., page 483 line 45.
Delete the sentence at page 482 line 53. Note that another comment deals with the mention of noise in this sentence.

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.6.4** *P* **482** *L* **53** # 158

Mi, Guangcan — Huawei Technologies Co., Ltd.

Comment Type **T** *Comment Status* **X**

OMA_TDECQ is used to calculate the threshold power, Pth_1 and Pth_2, which is set accroding to the equalized eye diagram as shown in Figure 180-11. OMA_TDECQ should not be measured at the input of the equalizer.

SuggestedRemedy

add the definition of OMA_TDECQ, "is measured as defined in 180.9.5 except using waveforms captured at the output
of the reference equalizer". Noise is added at the input of the reference equalizer.

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.6.4** *P* **482** *L* **53** # 45

Brown, Matt — Alphawave Semi

Comment Type **T** *Comment Status* **X**

The sentence "The TDECQ reference point where OMATDECQ is referenced to and noise is added is at the input of the reference equalizer." It is not clear which noise this is referring to. It would be good to link the AWGN noise source in Figure 180-10 with sigma_g. Note that another comment deals with the OMA_TDECQ in this sentence.

SuggestedRemedy

Delete the reference sentence.
On page 484 line 26 (the first reference to σG)...
Change the sentence to: "G_th1(y_i), which represents AWGN at the input to the reference equalizer (see Figure 180-10), is equivalent to a Gaussian probability density function with an RMS value of σ_G, centered around the sub-eye threshold P_th1."

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.6.4** *P* **482** *L* **53** # 29

Huber, Thomas — Nokia

Comment Type **E** *Comment Status* **X**

Awkward sentence: "The TDECQ reference point where OMA(sub)TDECQ is referenced to and noise is added is at the input of the reference equalizer."

SuggestedRemedy

Rewrite as:
"The reference point for OMA(sub)TDECQ, to which noise is added, is at the input of the reference equalizer."

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.6.4** *P* **485** *L* **5** # 63

Ran, Adee — Cisco Systems

Comment Type **T** *Comment Status* **X**

"the normalized frequency response Heq(f) of the reference equalizer"
The reference equalizer now includes a DFE, a nonlinear element, so it does not have a frequency response. The noise amplification is only due to the FFE.

SuggestedRemedy

Change "the normalized frequency response Heq(f) of the reference equalizer" to "the normalized frequency response Heq(f) of the FFE in the reference equalizer".
Implement with editorial license.

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.6.4** *P* **485** *L* **41** # 50

Rodes, Roberto — Coherent

Comment Type **TR** *Comment Status* **X**

TDECQ in 180-12 is a penalty on the OMA to calculate the Link power budget. Therefore, OMA in equation 180-12 should be equivalent to OMAouter as defined in 180.9.5.

SuggestedRemedy

Replace OMAtdecq with OMAouter in equation 180-12,and use editorial license to align the rest of the text in the subclause to this change

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.6.4** *P* **485** *L* **41** # 4

Maniloff, Eric — Ciena

Comment Type **TR** *Comment Status* **X**

Discrepancy in optical modulation amplitude used for OMAouter – T(D)ECQ penalty computation in link budget:
To compute the link budget the transmitter penalty (TECQ,TDECQ) per equation 180-12 is to be subtracted from the OMAouter measured per SC 180.9.5. However, in SC 180.9.6.4, equation 180-12 suggests using OMATDECQ as the reference level of the ideal PAM4 signal for computation of the transmitter penalty (TECQ,TDECQ). In case, OMAouter measured per SC 180.9.5 and OMATDECQ computed per SC 180.9.6.4 differ, the quantity OMAouter-TECQ or OMAouter-TDECQ used in the link budget will be incorrect.

SuggestedRemedy

In equation 180-12, substitute OMATDECQ with OMAouter (measured per SC 180.9.5) in the report of the TDECQ penalty.

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.6.4** *P* **485** *L* **42** # 157

Mi, Guangcan — Huawei Technologies Co., Ltd.

Comment Type **T** *Comment Status* **X**

TDECQ is comparing the maximum additive noise to the optical power in OMA as measurement of the eye opening. Therefore the OMA used in equation 180-12 and noise R should be measured at the same point, which is OMA_outer

SuggestedRemedy

change the OMA_TDECQ in equation 180-12 to OMA_outer, and update its definition text accordingly.

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.7** *P* **487** *L* **7** # 64

Ran, Adee — Cisco Systems

Comment Type **TR** *Comment Status* **X**

The probability of error is calculated for each n (index of the PAM4 symbol), not for each L_n (one of four values).

SuggestedRemedy

Change "The probability of error for each symbol L_n" to "The probability of error for the nth PAM4 symbol".

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.7** *P* **487** *L* **7** # 65

Ran, Adee — Cisco Systems

Comment Type **TR** *Comment Status* **X**

The phrase "within the limits of the target histogram of the nth symbol" is unclear.
I assume it means the samples that are within the specific histogram window (left or right) that is being calculated, for the nth symbol.

SuggestedRemedy

Change the quoted phrase to "within the window of the histogram corresponding to the G(\sigma) being calculated (left or right, see Figure 180-11) for the nth symbol".

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.7** *P* **487** *L* **8** # 66

Ran, Adee — Cisco Systems

Comment Type **TR** *Comment Status* **X**

"The amplitude of the M samples are y_(n,i)"
There is no definition of M other than this sentence (it is a poor way to define a notation).
Also y is not an amplitude but a power level of a specific sample.
The sentence is unclear and should be improved

SuggestedRemedy

Change "is calculated by first taking all the samples points"
to "is calculated from a set of samples of the nth symbol".
Change the quoted sentence to
"The sample levels are denoted y_(n,i). The number of samples is denoted by M".

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.7** *P* **487** *L* **45** # 67

Ran, Adee — Cisco Systems

Comment Type **TR** *Comment Status* **X**

The index k in equation 180-18 is undefined. It seems that it should be n.

SuggestedRemedy

Change k to n

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.7** *P* **488** *L* **14** # 68

Ran, Adee — Cisco Systems

Comment Type **TR** *Comment Status* **X**

It is unclear what "cumulated" means. Based on the equation it looks like an average.

SuggestedRemedy

Change "cumulated" to "average".

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.7** *P* **488** *L* **20** # 69

Ran, Adee — Cisco Systems

Comment Type **TR** *Comment Status* **X**

"where N is the pattern length"
Based on equations 180-22 and 180-18, it seems that the index n plus the codeword length d must be less than the pattern length.

SuggestedRemedy

Change "where N is the pattern length" to "where N is the pattern length minus d", with editorial license.

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.7** *P* **488** *L* **33** # 72

Ran, Adee — Cisco Systems

Comment Type **TR** *Comment Status* **X**

"\sigma_g is the maximum RMS \sigma of the AWGN"
AWGN has not been mentioned earlier. \sigma_g is simply the maximum value of \sigma.

SuggestedRemedy

Change the quoted phrase to "\sigma_g is the maximum value of \sigma".

In the paragraph preceding equation 180-16, change
"the probability of the ith sample of the nth symbol being in error"
To
"the probability of the ith sample of the nth symbol being in error, assuming an additive white Gaussian noise (AWGN) with RMS value of \sigma"

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.7** *P* **488** *L* **37** # 73

Ran, Adee — Cisco Systems

Comment Type **TR** *Comment Status* **X**

\sigma_s and C_eq have not been introduced in this subclause.
I assume it is the same as in 180.9.6.4.

SuggestedRemedy

Define \sigma_s and C_eq, using the definition in 180.9.6.4, with editorial license.

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.7.1** *P* **486** *L* **41** # 36

El-Chayeb, Ahmad — Keysight (ahmad.el-chayeb@keysight.com)

Comment Type **TR** *Comment Status* **X**

The number of samples/UI required for TDECQ_CER waveform acquisition is currently defined to require greater than 25 samples/UI. chayeb_3dj_01a_2511 (slide 6) shows improvement in TDECQ_CER measurement repeatability with 63.99 samples/UI.

SuggestedRemedy

Change the text below in the first paragraph in sub-clause 180.9.7.1:

"The waveform should be acquired with greater than 25 samples/UI."

to

"The waveform should be acquired with greater than 63 samples/UI."

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.7.1** *P* **486** *L* **41** # 51

Rodes, Roberto — Coherent

Comment Type **TR** *Comment Status* **X**

TDECQCER has significant variation, narrow histogram window and higher number of samples per UI improves the variability

SuggestedRemedy

specify >63 sample/UI and 0.02 UI width histograms. Replace "The waveform should be acquired with greater than 25 samples/UI. This provides at least one sample falling within both the left and the right 0.04 UI width histograms for each symbol." with "The waveform should be acquired with greater than 63 samples/UI and 0.02 UI width histogram. This provides at least one sample falling within both the left and the right 0.02 UI width histograms for each symbol."

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.7.1** *P* **488** *L* **30** # 71

Ran, Adee Cisco Systems

Comment Type **ER** *Comment Status* **X**

p is a term used in the equation, not part of the equation. It should be on a separate line. Also an explanation of what p means would be helpful (see another comment, technical, that addresses the definition of p)

SuggestedRemedy

Delete the part of the equation from the comma and on.
Add a text paragraph after the equation:
"Where p = (1-SER_target)^m is the probability of receiving a FEC symbol correctly."

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.7.1** *P* **488** *L* **30** # 70

Ran, Adee Cisco Systems

Comment Type **TR** *Comment Status* **X**

In equation 180-23, the intent seems to be that the number of error symbols is i (from 0 to k) and the number of correct symbols is d-i; that does not match the definition of p (which currently corresponds to "the probability of a symbol being correct").

To get matching CER_target and SER_target values in Table 180-17, the exponents need to be swapped.

I assume the current implementation in scopes is correct and the error is in the equation in the draft.

SuggestedRemedy

Change equation 180-23 to have p^(d-i) and (1-p)^I instead of the current exponents.

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.7.1** *P* **488** *L* **47** # 1

Maniloff, Eric Ciena

Comment Type **TR** *Comment Status* **X**

Discrepancy in optical modulation amplitude used for OMAouter – TDECQCER penalty computation in link budget:
To compute the link budget the transmitter penalty (TDECQCER) per equation 180-25 is to be subtracted from the OMAouter measured per SC 180.9.5. However, in SC 180.9.7.1, equation 180-26 suggests using OMATDECQ as the reference level of the ideal PAM4 signal for computation of the transmitter penalty (TDECQCER). In case, OMAouter measured per SC 180.9.5 and OMATDECQ computed per SC 180.9.7.1 differ, the quantity OMAouter- TDECQCER used in the link budget will be incorrect.

SuggestedRemedy

In equation 180-26, substitute OMATDECQ with OMAouter (measured per SC 180.9.5) in the report of the TDECQCER penalty.

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.7.1** *P* **489** *L* **5** # 156

Mi, Guangcan Huawei Technologies Co., Ltd.

Comment Type **E** *Comment Status* **X**

Equation 180-27 provides the definition of Qt function, which is first provoked in definiton of TDECQ. For better reading experience, this equation should be moved to where Qt was first used.

SuggestedRemedy

move equation 180-27 to after 180-12. change the text of Qt in page 485 to "is 3.428, consistent with the target symbol error ratio for Gray mapped PAM4,
and can be calculated according to Equation (180–13)". Change the text of Qt inpage489 to “is 3.428, consistent with the target symbol error ratio for Gray mapped PAM4,
and can be calculated according to Equation (180–13)”

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.8** *P* **488** *L* **46** # 52

Rodes, Roberto — Coherent

Comment Type **T** *Comment Status* **X**

TDECQCER in 180-25 is meant to be a penalty on the OMA to calculate the Link power budget. Therefore, OMA in equation 180-26 should be equivalent to OMAouter as defined in 180.9.5.

SuggestedRemedy

Replace OMAtdecq with OMAouter in equation 180-26,and use editorial license to align the rest of the text in the subclause to this change

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.9** *P* **489** *L* **13** # 116

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

Lets better organize 180.9.9

SuggestedRemedy

Propose changes
Rename 180.9.9 to Transmitter Functional Test
Add new section 180.9.9.1 Transmitter functional symbol error histogram
Move 1st and 2nd paragraph into 180.9.9.1 and leave the test setup in 180.9.9

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.9** *P* **489** *L* **24** # 74

Ran, Adee — Cisco Systems

Comment Type **E** *Comment Status* **X**

"The transmitter functional symbol error histogram mask for each lane is given in Table 180–18"
The TFSEH has not been defined yet; referencing the mask first is unclear. Also, the mask is referenced again in the next paragraph.

SuggestedRemedy

Delete the quoted sentence.
In the second paragraph, change "The error mask" to "The symbol error histogram mask".

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.9** *P* **489** *L* **28** # 9

Cole, Chris — Coherent Corp.

Comment Type **TR** *Comment Status* **X**

Descriptive text needs updating to accompany change to Table 180-18

SuggestedRemedy

Update text as per cole_3dj_01_2601

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.9** *P* **489** *L* **31** # 75

Ran, Adee — Cisco Systems

Comment Type **ER** *Comment Status* **X**

"Test_margin, defined in 180.9.9.1, determines the input BER"
It is unclear how the Test_margin determines the input BER; is the input BER different from the numeric values of BER given in the previous sentence?

The quoted sentence does not seem to add any clarity, and is confusing.

SuggestedRemedy

Delete the quoted sentence.

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.9** *P* **489** *L* **36** # 117

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

In DJ D2.2 it was proposed to add JTOL to FRx which overlay complex and difficult to meet, but if just define CDR loop BW is ≤ 4 MHz that would be sufficent

SuggestedRemedy

Add: Transmitter functional receiver CDR has a 3 dB loop bandwidth of ≤4.0 MHz.

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.9** *P* **489** *L* **40** # 125

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

802.3dj has spend last 1 year to best capture jitter in TDECQ and FRx, unless xAUI-n (C2M) interface operate with jitter tolerance condition in 176D.8.14 TDECQ measurement maybe be too optimistic see also unsatisfied comments aginst D2.1 and D2.2

SuggestedRemedy

Add sentence on 46: For thoes cases there is a xAUI-n chipto-module (C2M) interface TDECQ must be met with Module stressed input condition in 176D.8.14 for 200 Gb/s AUI and in 120E.3.4.1 for 100 Gb/s AUI.The received test patterns shall be asynchronous to the pattern used to test the transmitter, and shall
have power levels as specified in Table 180–8 for the aggressor lanes in the stressed receiver
sensitivity test.
See ghiasi_3dj_02_2601

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.9** *P* **489** *L* **43** # 76

Ran, Adee — Cisco Systems

Comment Type **TR** *Comment Status* **X**

It has become clear that the TFSEH test does not guarantee interoperability with any compliant receiver, since the functional receiver is likely better than minimally compliant receivers in parameters other than the sensitivity, which are not calibrated in the test (for example, jitter tolerance and equalization capabilities).

Thus, meeting the TFSEH mask in a specific test is a required but not sufficient condition for compliance.

Readers should be informed of this situation.

SuggestedRemedy

Add the following text and informative note after the second paragraph of 180.9.9:
A compliant transmitter meets the error mask in Table 180-18 for any functional receiver.

NOTE—With any specific functional receiver as defined in 180.9.9.1, meeting the error mask is required but not necessarily sufficient for proving transmitter compliance.

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.9** *P* **489** *L* **45** # 10

Cole, Chris — Coherent Corp.

Comment Type **TR** *Comment Status* **X**

Table 180-18 needs updating to include relevant probabilities only

SuggestedRemedy

Update Table180-18 as per cole_3dj_01_2601

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.9** *P* **489** *L* **47** # 2

Maniloff, Eric — Ciena

Comment Type **TR** *Comment Status* **X**

For symbol errors ≥ 9 Table 180-18 specifies flat counts, consistent with a pre FEC BER ~2.3E-4. This implies that a transmitter could have a large error floor and still pass the test. It would be preferable to specify the actual probabilities consistent with a value of ~1e-26 or include no values with an informative note indicating these bins should have no measured occurances.

The measurement time to determine the probabilities for k≥9 in unreasonably long for the 2.4e-5 BER defined in this clause.

SuggestedRemedy

Update the values in Table 180-18 for symbol errors ≥ 9 to remove the flat mask. Remove these values and include a note that these bins should record zero counts.

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.9.1** *P* **490** *L* **26** # 11

Cole, Chris — Coherent Corp.

Comment Type **TR** *Comment Status* **X**

Equations 180-28 through 180-31 need updating for full alignment with Tables 180-7 and 180-9

SuggestedRemedy

Update 180.9.9.1 equations and text as per cole_3dj_01_2601

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.9.1** *P* **490** *L* **34** # 77

Ran, Adee Cisco Systems

Comment Type **TR** *Comment Status* **X**

The Test_margin term seems to relax the requirements of the test; the attenuation is reduced by 1.5 dB (half of the channel insertion loss budget in Table 180-9!) compared to what the power budget requires, so the receiver is getting a much stronger signal than the worst case.

There is no justification in the standard or in the proposals for this large relaxation.

Combined with the expectation that a functional receiver will be better than the worst case receiver (comply with all specifications with some margin), this makes the test practically impossible to fail, and thus quite useless as a screening method.

In discussion in the ad hoc it was claimed that the relaxation is balanced by a tighter histogram mask. But this is an arbitrary combination that is not aligned with the other specifications in this clause. In addition, this results in longer time required to verify that the lower probability mask is not exceeded.

To improve interoperability, the margin should be applied in the other direction - require a higher attenuation than the worst case power budget - similar to applying a worst-case stressed signal into the receiver in receiver tests.

The suggested remedy also reduces the margin to a more reasonable value of 0.5 dB to avoid excessive overstress. It also makes a higher mask based on the receiver compliance requirements in Table 180–20, which enables shorter test time (or better resolution with the same test time).

Alternatively, the margin can be removed altogether.

SuggestedRemedy

In equation 180-28, change the sign of Test_margin from minus to plus. Change the description of Test_margin to "is additional attenuation intended to create margin in the link budget, with a value of 0.5 dB".
In Table 180–18, change the probabilities to match those of column "p=1" in Table 180–20.
Implement with editorial license.

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.14** *P* **492** *L* **20** # 78

Ran, Adee Cisco Systems

Comment Type **TR** *Comment Status* **X**

"when measured using the test pattern and sampling range specified for OMAouter measurement in 180.9.5"

OMA_outer is currently defined before the reference equalizer, but this would not create the flat regions shown in Figure 180–8. As suggested in another comment, OMA_outer should be defined after the reference equalizer (with appropriate normalization) instead.

Assuming noise measurement for RINxxOMA should still be done before the reference equalizer, measuring using PRBS13Q will not create the required flat regions, since the maximum run length for P0 is 6, much shorter than the reference equalizer length. The test patterns for RINxxOMA should be changed to SSPRQ or quaternary square wave, both of which have longer runs (15 or 8 respectively), or a longer square wave pattern which implementations may have (subject of another comment against clause 176).

The existing text already defines "on a region in a place in the pattern that is selected to minimize the measurement error" which is enough if the pattern has a flat region.

SuggestedRemedy

In Table 180–14, change the patterns for RINxxOMA from "4 or 6" to "Square wave or 6". Change the quoted phrase to "when measured using the test pattern specified for RINxxOMA in Table 180–14".

Add an allowance in 180.9.14 or in Table 180–14 to use a lower frequency square wave test pattern if available (with editorial license).

Implement the same changes in corresponding places in clauses 181, 182, and 183.

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.15** *P* **492** *L* **45** # 15

Cole, Chris Coherent Corp.

Comment Type **TR** *Comment Status* **X**

The conformance test signal requires additional specification.

SuggestedRemedy

Update text to: "The conformance test signal at TP3 is the stressed receiver sensitivity test signal, specified in 180.9.16 " with exception as per cole_3dj_01_2601

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.15** *P* **492** *L* **54** # 79

Ran, Adee — Cisco Systems

Comment Type **E** *Comment Status* **X**

The BLER requirements, the notes, the statement about precoding, and the tables apply equally to RS (180.9.15) and to SRS (180.9.16).

The text in 180.9.16 is missing the first note.

Instead of repeating the content (which is most of the text of 180.9.15), it may be preferable to move the common part to a separate subclause, as was done for example in 179.9.5.2.

SuggestedRemedy

Create a new subclause before 180.9.15 that defines the error ratio requirements, with the content from the 3rd paragraph of 180.9.15 down to the end and point to the new subclause from 180.9.15 and 180.9.16.

If this is not done, add the missing NOTE in 180.9.16.

Make similar changes in corresponding subclauses of clauses 181, 182, 183. Implement with editorial license.

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.15** *P* **493** *L* **10** # 102

Dudek, Mike — Marvell

Comment Type **E** *Comment Status* **X**

It would be better to describe the precoding before the details of the BLER test in this stressed receiver sensitivity sub section.

SuggestedRemedy

Move "Precoding (see 176.7.1.2) is enabled if the receiver requests precoding using the ILT function." to page 494 line 32. Make the equivalent change in clauses 181, 182 and 183 (if it is added per a different comment).

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.15** *P* **493** *L* **10** # 101

Dudek, Mike — Marvell

Comment Type **E** *Comment Status* **X**

It would be better to describe the precoding before the details of the test in this Receiver Sensitivity sub section.

SuggestedRemedy

Move "Precoding (see 176.7.1.2) is enabled if the receiver requests precoding using the ILT function." to page 492 line 47. Make the equivalent change in clauses 181, 182 and 183 (if it is added per a different comment).

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.15** *P* **494** *L* **14** # 103

Dudek, Mike — Marvell

Comment Type **T** *Comment Status* **X**

The final bin is for ">=16" not for "16" test symbol errors per test block

SuggestedRemedy

Change "16" to "<=16" here and on page 639 line 23, page 805 line 31, page 833 line 53, page 396 line 48 and page 437 line 53 and page 499 line 23

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.16** *P* **494** *L* **17** # 55

Rodes, Roberto — Coherent

Comment Type **E** *Comment Status* **X**

Receiver Sensitivity and Stressed Receiver Sensitivity (SRS) conformance test definitions might need some refinement. Currently, SRS test method reference to an older 121.8.10 subclause where some of the parameters such SECQ-10log(Ceq) should not longer apply. It would be very benefitial to bring the SRS conformace test methodology to Clause 180 to better enable feedback to update it. Similar to what it was done with TDECQ methodology.

SuggestedRemedy

Bring the test method description in 121.8.10 to 180.9.16

Proposed Response *Response Status* **O**

Cl **180** *SC* **180.9.16** *P* **494** *L* **21** # 80

Ran, Adee Cisco Systems

Comment Type **TR** *Comment Status* **X**

"The SECQ of the stressed receiver conformance test signal is measured according to 180.9.6, except that the test fiber is not used"
This means that SECQ is equivalent to TECQ (180.9.8) which has exactly that definition. So why not use that definition?

There is an important difference: meeting a transmitter specification (e.g. TECQ) can be verified without optimizing the equalizer to the specific requirement - sub-optimal equalizer that yields a result below the limit is sufficient. But for SRS, if the equalizer is sub-optimal then SECQ will be higher and less stress will be applied. Therefore, non-optimal equalization can lead to under-stressed testing.

SuggestedRemedy

Change the quoted sentence to
"The SECQ of the stressed receiver conformance test signal is defined as the TECQ measured according to 180.9.8 at the output of the E/O converter, with reference equalizer coefficients that minimize TECQ."

Add an informative note after the list of exceptions:
"NOTE—Practical implementations can have sub-optimal coefficients that result in increased SECQ, which would lead to an under-stressed test signal. In such cases, reduction of the TECQ as a guard band for SECQ is recommended."

Make similar changes in corresponding subclauses of clauses 181, 182, 183. Implement with editorial license.

Proposed Response *Response Status* **O**

Cl **180A** *SC* **180A.4.1** *P* **939** *L* **33** # 87

Ran, Adee Cisco Systems

Comment Type **T** *Comment Status* **X**

The situations described in the text, of MDI connectors that are not fully utilized (some lanes not connected to a PMD) or are used with multiple PMDs (breakout), are not detectable by a link partner that is connected to the other side of the cable plant.

In such situations, the link partner needs to be configured by management to the corresponding PMD combination. This should be noted for readers.

Also in 180A.4.2.

SuggestedRemedy

Add the following informative note:
NOTE—The PMD types on both sides of the fiber need to match. When the MDI is used for multiple PMDs or for PMDs with lower number of lanes than the MDI supports, appropriate configuration is required. The means for selecting the appropriate configuration are beyond the scope of this standard.

Add a similar note in 180A.4.2.
Implement with editorial license.

Proposed Response *Response Status* **O**

Cl **181** *SC* **181.7.1** *P* **506** *L* **44** # 113

Ghiasi, Ali Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

With TDECQ expected to capture jitter more accuratly now that explicit jitter measurmeent are removed the CRU maximum peaking must be defined, also the slope should be -20 dB not 20 dB.

SuggestedRemedy

Origonal text: The clock recovery unit (CRU) has a corner frequency of 4 MHz and a slope of 20 dB/decade.
proposed text: The clock recovery unit (CRU) has a 3 dB corner frequency of 4 MHz and a slope of -20 dB/decade. The CRU maximum jitter transfer peak is ≤0.3 dB from 40 kHz to 20 MHz.

Proposed Response *Response Status* **O**

Cl **181** *SC* **181.7.1** *P* **510** *L* **19** # 151

He, Michael He — TeraHop

Comment Type **T** *Comment Status* **X**

With volume production transceiver data available, we need to rebalance Tx and Rx OMAouter spec to optimize for cost, power efficiency.

SuggestedRemedy

Recommend to reduce Rx sens. by 0.7dB, and shift Tx OMAouter down by 0.7dB accordingly. May discuss it as a follow up contribution to support our comments.

Proposed Response *Response Status* **O**

Cl **181** *SC* **181.7.1** *P* **510** *L* **24** # 109

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

In D2.0 1T DFE was added to the TDECQ equalizer which reduces the need for transmiteer overshoot where TDECQ doesn't capture peak-to-average ratio and may result in BER degradation with improving TDECQ.

SuggestedRemedy

Reduce transmitter overshoot from 22% to 12% or alternatively incorporate overshoot penalty assuming ENOB of 6 bits into TDECQ
see ghiasi_3dj_01_2601 also see unsatisfied comment

Proposed Response *Response Status* **O**

Cl **181** *SC* **181.7.2** *P* **511** *L* **26** # 152

He, Michael He — TeraHop

Comment Type **T** *Comment Status* **X**

same as above

SuggestedRemedy

same as above

Proposed Response *Response Status* **O**

Cl **181** *SC* **181.9.6** *P* **518** *L* **45** # 81

Ran, Adee — Cisco Systems

Comment Type **TR** *Comment Status* **X**

TDECQ is defined based on 180.9.6, without the subclauses .2 - .4 (which leaves only one subclause 181.9.6.1).
The test setup for FR/LR is likely different than that of DR (based on Figure 122-4 having an "optical filter" block that Figure 121-4 does not have).

Similarly in 182.9.6 and 183.9.6.

SuggestedRemedy

Create 181.9.6.1 through 181.9.6.4, with titles of the corresponding subclauses in clause 180. For 181.9.6.1, add a diagram with an optical filter (and any other differences). For 181.9.6.2, use the content of the existing 181.9.6.1. For other subclauses, point to the corresponding subclauses in clause 180.

Make similar changes in corresponding subclauses of clauses 182 and 183 with references to the appropriate figures. Implement with editorial license.

Proposed Response *Response Status* **O**

Cl **181** *SC* **181.9.6** *P* **518** *L* **46** # 126

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

802.3dj has spend last 1 year to best capture jitter in TDECQ and FRx, unless xAUI-n (C2M) interface operate with jitter tolerance condition in 176D.8.14 TDECQ measurement maybe be too optimistic see also unsatisfied comments aginst D2.1 and D2.2

SuggestedRemedy

Add sentence on 46: For thoes cases there is a xAUI-n chipto-module (C2M) interface TDECQ must be met with Module stressed input condition in 176D.8.14 for 200 Gb/s AUI and in 120E.3.4.1 for 100 Gb/s AUI.
See ghiasi_3dj_02_2601

Proposed Response *Response Status* **O**

Cl **181** *SC* **181.9.9** *P* **520** *L* **1** # 12

Cole, Chris — Coherent Corp.

Comment Type **TR** *Comment Status* **X**

Exceptions to equations 180-28 through 180-31 need updating for full alignment with Tables 181-5 and 181-7

SuggestedRemedy

Update 181.9.9 text as per cole_3dj_01_2601

Proposed Response *Response Status* **O**

Cl **181** *SC* **181.9.9** *P* **520** *L* **11** # 97

Dudek, Mike — Marvell

Comment Type **TR** *Comment Status* **X**

The test calls out a fiber that is compliant to Table 181-13, but that table shows a minimum and maximum chromatic dispersion, so a patch cord is compliant to that table. This test is intended to include the effects of chromatic dispersion. The proposed solution uses the same channel as the TDECQ test.

SuggestedRemedy

Replace "The transmitter under test is connected to the FRx by a test fiber which meets the transmitter compliance channel specifications in Table 181–13." with “The transmitter under test is connected to the FRx by a test fiber which meets the requirements provided in section 181.9.6.2.” Make the equivalent changes in clause 182 and 183. (Suggestion is not to change clause 180 as due to the small amount of chromatic dispersion expected a patch cord is acceptable).

Proposed Response *Response Status* **O**

Cl **181** *SC* **181.9.9** *P* **520** *L* **12** # 119

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

In DJ D2.2 it was proposed to add JTOL to FRx which overlay complex and difficult to meet, but if just define CDR loop BW is ≤ 4 MHz that would be sufficent

SuggestedRemedy

Add: Transmitter functional receiver CDR has a 3 dB loop bandwidth of ≤4.0 MHz.

Proposed Response *Response Status* **O**

Cl **181** *SC* **181.9.9** *P* **520** *L* **26** # 118

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

Lets better organize 181.9.9

SuggestedRemedy

Propose changes
Rename 181.9.9 to Transmitter Functional Test
Change the reference for functional symbol error histogram from 180.9.9 to 180.9.9.1

Proposed Response *Response Status* **O**

Cl **181** *SC* **181.9.15** *P* **521** *L* **32** # 16

Cole, Chris — Coherent Corp.

Comment Type **TR** *Comment Status* **X**

The conformance test signal requires additional specification.

SuggestedRemedy

Update text to: "The conformance test signal at TP3 is the stressed receiver sensitivity test signal, specified in 181.9.16 " with exception as per cole_3dj_01_2601

Proposed Response *Response Status* **O**

Cl **182** *SC* **182.5.2** *P* **538** *L* **17** # 30

Huber, Thomas — Nokia

Comment Type **ER** *Comment Status* **X**

"ISL training function" should be "ILT function"

SuggestedRemedy

Change "ISL training function" to "ILT function"

Proposed Response *Response Status* **O**

Cl **182** *SC* **182.7.1** *P* **538** *L* **18** # 114

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

With TDECQ expected to capture jitter more accuratly now that explicit jitter measurmeent are removed the CRU maximum peaking must be defined, also the slope should be -20 dB not 20 dB.

SuggestedRemedy

Origonal text: The clock recovery unit (CRU) has a corner frequency of 4 MHz and a slope of 20 dB/decade.
proposed text: The clock recovery unit (CRU) has a 3 dB corner frequency of 4 MHz and a slope of -20 dB/decade. The CRU maximum jitter transfer peak is ≤0.3 dB from 40 kHz to 20 MHz.

Proposed Response *Response Status* **O**

Cl **182** *SC* **182.7.1** *P* **541** *L* **36** # 37

El-Chayeb, Ahmad — Keysight (ahmad.el-chayeb@keysight.com)

Comment Type **TR** *Comment Status* **X**

TDECQ_CER will capture additional penalties that TDECQ does not. TDECQ_CER will also have up to 0.5dB variability.

SuggestedRemedy

Add a 1dB excursion to the limit of TDECQ_CER to be consitent with clauses 180 and 181.

Proposed Response *Response Status* **O**

Cl **182** *SC* **182.7.1** *P* **541** *L* **36** # 110

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

In D2.0 1T DFE was added to the TDECQ equalizer which reduces the need for transmiteer overshoot where TDECQ doesn't capture peak-to-average ratio and may result in BER degradation with improving TDECQ.

SuggestedRemedy

Reduce transmitter overshoot from 22% to 12% or alternatively incorporate overshoot penalty assuming ENOB of 6 bits into TDECQ
see ghiasi_3dj_01_2601 also see unsatisfied comment

Proposed Response *Response Status* **O**

Cl **182** *SC* **182.9.2** *P* **549** *L* **25** # 82

Ran, Adee — Cisco Systems

Comment Type **E** *Comment Status* **X**

The reference receiver is defined by reference to 180.9.2 with a single exception which is almost the whole definition.

SuggestedRemedy

Define the reference receiver using text as in the fist patagraph of 180.9.2. Refer to 180.9.2 for the CRU and the block diagram.
Implement with editorial license.

Proposed Response *Response Status* **O**

Cl **182** *SC* **182.9.6** *P* **550** *L* **38** # 127

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

802.3dj has spend last 1 year to best capture jitter in TDECQ and FRx, unless xAUI-n (C2M) interface operate with jitter tolerance condition in 176D.8.14 TDECQ measurement maybe be too optimistic see also unsatisfied comments aginst D2.1 and D2.2

SuggestedRemedy

Add sentence on 46: For thoes cases there is a xAUI-n chipto-module (C2M) interface TDECQ must be met with Module stressed input condition in 176D.8.14 for 200 Gb/s AUI and in 120E.3.4.1 for 100 Gb/s AUI.
See ghiasi_3dj_02_2601

Proposed Response *Response Status* **O**

Cl **182** SC **182.9.7** P **552** L **14** # 83

Ran, Adee — Cisco Systems

Comment Type **TR** *Comment Status* **X**

The SER and CER targets in Table 182-16 were adopted by the response to comment #114 against D2.2 and the referenced presentation <https://www.ieee802.org/3/dj/public/25_11/chayeb_3dj_01a_2511.pdf>. No rationale was provided for the values.

The target CER in this case is the maximum expected failure rate of the inner FEC. An analysis resulting in estimate of this value has been provided in the ad hoc presentation <https://www.ieee802.org/3/dj/public/adhoc/optics/0623_OPTX/ran_3dj_logic_01_230629.pdf>. Given the 12-way interleaving, and combining results in slide 6 and in slide 12 of that presentation, the allowed inner FEC failure ratio is 30*2.85e-4 = 8.55e-3. This should be the value of CER_target for consistency with the existing definitions (i.e. ignoring error floor).

Using this CER_target and the values k=3, m=1, and d=64 from Table 182-16, Equation 180-23 (corrected, based on another comment) can be solved to yield the SER_target=1.25e-2.

Note that these values are higher than the existing values (which relaxes the transmitter requirements), because the 12-way interleaving reduces the error correlation below that of random errors.

As an alternative, to protect against an error floor, the CER_target can be reduced by an order of magnitude to 8.55e-4; this would result in SER_target of 6.55e-3.

SuggestedRemedy

In Table 182-16, change the values of SER_target and CER_target to 1.25e-2 and 8.55e-3, respectively.
Apply the same changes in Table 183-16.

Proposed Response *Response Status* **O**

Cl **182** SC **182.9.9** P **546** L **7** # 129

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

Section 182.9.9 Transmitter functional symbol error histogram that should move into 182.9.9.1

SuggestedRemedy

Propsoed modification:
Make 182.9.9 Functional Receiver
Add the following to section 182.9.9 - "Functional receiver is an optical receiver with a PMA that meets or exceed receiver sensitivity condition in table 182-8 and is capable of symbol error reporting."
and Move 3rd paragraph in 182.9.9 into the same section "For thoes cases ..."
Move the current content of 182.9.9 into 182.9.9.1

Proposed Response *Response Status* **O**

Cl **182** SC **182.9.9** P **552** L **24** # 13

Cole, Chris — Coherent Corp.

Comment Type **TR** *Comment Status* **X**

Exceptions to equations 180-28 through 180-31 need updating for full alignment with Tables 182-7 and 182-9

SuggestedRemedy

Update 182.9.9 text as per cole_3dj_01_2601

Proposed Response *Response Status* **O**

Cl **182** SC **182.9.9** P **552** L **25** # 120

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

Lets better organize 182.9.9

SuggestedRemedy

Propose changes
Rename 182.9.9 to Transmitter Functional Test
Change the reference for functional symbol error histogram from 180.9.9 to 180.9.9.1

Proposed Response *Response Status* **O**

Cl **182** *SC* **182.9.9** *P* **552** *L* **36** # 121

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

In DJ D2.2 it was proposed to add JTOL to FRx which overlay complex and difficult to meet, but if just define CDR loop BW is ≤ 4.27 MHz that would be sufficent

SuggestedRemedy

Add: Transmitter functional receiver CDR has a 3 dB loop bandwidth of ≤4.27 MHz.

Proposed Response *Response Status* **O**

Cl **182** *SC* **182.9.15** *P* **553** *L* **51** # 17

Cole, Chris — Coherent Corp.

Comment Type **TR** *Comment Status* **X**

The conformance test signal requires additional specification.

SuggestedRemedy

Update text to: "The conformance test signal at TP3 is the stressed receiver sensitivity test signal, specified in 182.9.16 " with exception as per cole_3dj_01_2601

Proposed Response *Response Status* **O**

Cl **183** *SC* **183.5.2** *P* **569** *L* **15** # 31

Huber, Thomas — Nokia

Comment Type **ER** *Comment Status* **X**

"ISL training function" should be "ILT function"

SuggestedRemedy

Change "ISL training function" to "ILT function"

Proposed Response *Response Status* **O**

Cl **183** *SC* **183.7.1** *P* **569** *L* **22** # 115

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

With TDECQ expected to capture jitter more accuratly now that explicit jitter measurmeent are removed the CRU maximum peaking must be defined, also the slope should be -20 dB not 20 dB.

SuggestedRemedy

Origonal text: The clock recovery unit (CRU) has a corner frequency of 4 MHz and a slope of 20 dB/decade.
proposed text: The clock recovery unit (CRU) has a 3 dB corner frequency of 4 MHz and a slope of -20 dB/decade. The CRU maximum jitter transfer peak is ≤0.3 dB from 40 kHz to 20 MHz.

Proposed Response *Response Status* **O**

Cl **183** *SC* **183.7.1** *P* **573** *L* **8** # 111

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

In D2.0 1T DFE was added to the TDECQ equalizer which reduces the need for transmiteer overshoot where TDECQ doesn't capture peak-to-average ratio and may result in BER degradation with improving TDECQ.

SuggestedRemedy

Reduce transmitter overshoot from 22% to 12% or alternatively incorporate overshoot penalty assuming ENOB of 6 bits into TDECQ
see ghiasi_3dj_01_2601 also see unsatisfied comment

Proposed Response *Response Status* **O**

Cl **183** *SC* **183.7.1** *P* **573** *L* **25** # 153

He, Michael He — TeraHop

Comment Type **T** *Comment Status* **X**

same as above

SuggestedRemedy

same as above

Proposed Response *Response Status* **O**

Cl **183** *SC* **183.7.1** *P* **573** *L* **37** # 38

El-Chayeb, Ahmad — Keysight (ahmad.el-chayeb@keysight.com)

Comment Type **TR** *Comment Status* **X**

TDECQ_CER will capture additional penalties that TDECQ does not. TDECQ_CER will also have up to 0.5dB variability.

SuggestedRemedy

TDECQ_CER will capture additional penalties that TDECQ does not. TDECQ_CER will also have up to 0.5dB variability.

For 800GBASE-FR4, change TDECQ_CER limit to 4.4dB
For 800GBASE-LR4, change TDECQ_CER limit to 4.9dB

Proposed Response *Response Status* **O**

Cl **183** *SC* **183.7.2** *P* **575** *L* **26** # 154

He, Michael He — TeraHop

Comment Type **T** *Comment Status* **X**

same as above

SuggestedRemedy

same as above

Proposed Response *Response Status* **O**

Cl **183** *SC* **183.9.2** *P* **582** *L* **35** # 84

Ran, Adee — Cisco Systems

Comment Type **E** *Comment Status* **X**

The reference receiver is defined by reference to 180.9.2 with a single exception which is almost the whole definition.

SuggestedRemedy

Define the reference receiver using text as in the fist patagraph of 180.9.2. Refer to 180.9.2 for the CRU and the block diagram.
Implement with editorial license.

Proposed Response *Response Status* **O**

Cl **183** *SC* **183.9.5** *P* **462** *L* **8** # 131

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

TDECQ mission mode test definition should be made more clear

SuggestedRemedy

Propsoed text
TDECQ is defined with all receive xAUI-n lanes when instantiated in operation using test pattern 3 or 5 (see Table 180–13). xAUI-n lanes operate with receiver jitter tolerance condition defined by applicable instantiated xAUI-n.
The received test patterns shall be asynchronous to the pattern used to test the transmitter, and shall
have power levels as specified in Table 180–8 for the aggressor lanes in the stressed receiver
sensitivity test.

Proposed Response *Response Status* **O**

Cl **183** *SC* **183.9.6** *P* **583** *L* **46** # 128

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

802.3dj has spend last 1 year to best capture jitter in TDECQ and FRx, unless xAUI-n (C2M) interface operate with jitter tolerance condition in 176D.8.14 TDECQ measurement maybe be too optimistic see also unsatisfied comments aginst D2.1 and D2.2

SuggestedRemedy

Add sentence on 46: For thoes cases there is a xAUI-n chipto-module (C2M) interface TDECQ must be met with Module stressed input condition in 176D.8.14 for 200 Gb/s AUI and in 120E.3.4.1 for 100 Gb/s AUI.
See ghiasi_3dj_02_2601

Proposed Response *Response Status* **O**

Cl **183** *SC* **183.9.9** *P* **581** *L* **10** # 130

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

Section 183.9.9 Transmitter functional symbol error histogram that should move into 183.9.9.1

SuggestedRemedy

Propsoed modification:
Make 183.9.9 Functional Receiver
Add the following to section 183.9.9 - "Functional receiver is an optical receiver with a PMA that meets or exceed receiver sensitivity condition in table 183-8 and is capable of symbol error reporting."
and Move 3rd paragraph in 183.9.9 into the same section "For thoes cases ..."
Move the current content of 183.9.9 into 183.9.9.1

Proposed Response *Response Status* **O**

Cl **183** *SC* **183.9.9** *P* **585** *L* **25** # 14

Cole, Chris — Coherent Corp.

Comment Type **TR** *Comment Status* **X**

Exceptions to equations 180-28 through 180-31 need updating for full alignment with Tables 183-6 and 183-8

SuggestedRemedy

Update 183.9.9 text as per cole_3dj_01_2601

Proposed Response *Response Status* **O**

Cl **183** *SC* **183.9.9** *P* **585** *L* **26** # 122

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

Lets better organize 183.9.9

SuggestedRemedy

Propose changes
Rename 183.9.9 to Transmitter Functional Test
Change the reference for functional symbol error histogram from 180.9.9 to 180.9.9.1

Proposed Response *Response Status* **O**

Cl **183** *SC* **183.9.9** *P* **585** *L* **36** # 123

Ghiasi, Ali — Ghiasi Qunatum/Marvell

Comment Type **TR** *Comment Status* **X**

In DJ D2.2 it was proposed to add JTOL to FRx which overlay complex and difficult to meet, but if just define CDR loop BW is ≤ 4.27 MHz that would be sufficent

SuggestedRemedy

Add: Transmitter functional receiver CDR has a 3 dB loop bandwidth of ≤4.27 MHz.

Proposed Response *Response Status* **O**

Cl **183** *SC* **183.9.15** *P* **587** *L* **6** # 18

Cole, Chris — Coherent Corp.

Comment Type **TR** *Comment Status* **X**

The conformance test signal requires additional specification.

SuggestedRemedy

Update text to: "The conformance test signal at TP3 is the stressed receiver sensitivity test signal, specified in 183.9.16 " with exception as per cole_3dj_01_2601

Proposed Response *Response Status* **O**

Cl **183** *SC* **183.9.15** *P* **587** *L* **25** # 100

Dudek, Mike — Marvell

Comment Type **TR** *Comment Status* **X**

Other optical clauses (e.g. clause 180, 181 and 182) provide precoding if the receiver requests it to improve receiver sensitivity and stressed receiver sensitivty.

SuggestedRemedy

Add "Precoding (see 176.7.1.2) is enabled if the receiver requests precoding using the ILT function." at line 25 and also on page 588 line 2.

Proposed Response *Response Status* **O**

Cl **184** *SC* **184.5.7** *P* **609** *L* **48** # 149

Slavick, Jeff
Broadcom

Comment Type **T** *Comment Status* **X**

Clause 177 normatively states that last error bin increments when more bits are changed than its value, while Clause 184 states it as a Note.

SuggestedRemedy

Change "Note that bin 4 is for 4 for more" to "Error bin 4 increments when 4 or more"

Proposed Response *Response Status* **O**

Cl **185A** *SC* **185A.2.4.10** *P* **952** *L* **18** # 98

Dudek, Mike
Marvell

Comment Type **T** *Comment Status* **X**

The magnitude variation is measured relative to the 0dB level over the 3dB bandwidth. It must therefore be at least 3dB (unless measured over the minimum value specified and the actual bandwidth is much larger. However in table 185-13 and 187-13 the value is required to be 1dB max.

SuggestedRemedy

Change "over the specified 3dB bandwidth" to "over 0.75 of the specified minimum 3dB bandwidth."

Proposed Response *Response Status* **O**

Cl **186A** *SC* **186A** *P* **956** *L* **18** # 44

Brown, Matt
Alphawave Semi

Comment Type **TR** *Comment Status* **X**

Draft 2.2 comment #152 requested that test vectors be incorporated into the draft. The response pointed out that relevant test vectors are provided publicly by OIF but need some exceptions. During comment resolution, one participant offered to provide appropriate text vectors.

SuggestedRemedy

Provide text vectors for Clause 186 FEC or reference the OIF test vectors noting exceptions.

Proposed Response *Response Status* **O**