Cl **180**   *SC* **180.8.5**   *P* **364**   *L* **23**   # 1

Johnson, John   Broadcom

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

121.8.5.2 Table 121-11 specifies ORL of 21.4dB be applied for TX testing. For 200GBASE-DR1, this needs to be 15.1dB.

SuggestedRemedy

Add a new exception to the list in 180.8.5:
"- The optical return loss is as given in Table 180-6."

Proposed Response   *Response Status* **O**

Cl **181**   *SC* **181.8.5**   *P* **386**   *L* **41**   # 2

Johnson, John   Broadcom

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

The TDECQ methods reference channel requirements in 121.8.5.2 instead of the channel requirements in local clause 181.8.5.1.

SuggestedRemedy

Replace the reference to 121.8.5.2 with reference to 181.8.5.1.

Proposed Response   *Response Status* **O**

Cl **182**   *SC* **182.8.5**   *P* **411**   *L* **30**   # 3

Johnson, John   Broadcom

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

121.8.5.2 Table 121-11 specifies ORL of 21.4dB be applied for TX testing. For 200GBASE-FR1, this needs to be 17.1dB.

SuggestedRemedy

Add a new exception to the list in 182.8.5:
"- The optical return loss is as given in Table 182-7."

Proposed Response   *Response Status* **O**

Cl **181**   *SC* **181.1**   *P* **372**   *L* **16**   # 4

Johnson, John   Broadcom

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

The PHY bracket in Figure 181-1 is shown encompassing the MDI layer, which isn't consistent with previous PMDs.

SuggestedRemedy

Shorten the PHY bracket to exclude the MDI layer.

Proposed Response   *Response Status* **O**

Cl **182**   *SC* **182.1**   *P* **395**   *L* **21**   # 5

Johnson, John   Broadcom

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

The PHY bracket in Figure 182-1 does not encompass the PMD layer, which isn't consistent with previous PMDs.

SuggestedRemedy

Lengthen the PHY bracket to include the PMD layer.

Proposed Response   *Response Status* **O**

Cl **181**   *SC* **181.6.1**   *P* **378**   *L* **13**   # 6

Johnson, John   Broadcom

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

Total average launch power (max) in Table 181-5 is TBD for 800GBASE-FR4-500.

SuggestedRemedy

Replace TBD with a value equal to the Average launch power, each lane (max) + 6 dB, which is 4.9 + 6 = 10.9 dB. This methodology is consistent with previous FR4 PMDs (clauses 122, 151).

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **6**

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Cl **183**   *SC* **183.6.1**   *P* **425**   *L* **16**   # 7

Johnson, John   Broadcom

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

Total average launch power (max) in Table 183-6 is TBD for 800GBASE-FR4.

SuggestedRemedy

Replace TBD with a value equal to the Average launch power, each lane (max) + 6 dB, which is 4.9 + 6 = 10.9 dB. This methodology is consistent with previous FR4 PMDs (clauses 122, 151) and 800GBASE-LR4 in this Table.

Proposed Response   *Response Status* **O**

Cl **181**   *SC* **181.6.1**   *P* **378**   *L* **23**   # 8

Johnson, John   Broadcom

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

Difference in launch power between any two lanes (OMAouter) (max) in Table 181-5 is TBD for 800GBASE-FR4-500.

SuggestedRemedy

Replace TBD with a value of OMAouter(max) minus OMAouter(min) or 4 dB, whicher is smaller, consistent with other FRn/LRn clauses (122, 151).

Proposed Response   *Response Status* **O**

Cl **183**   *SC* **183.6.1**   *P* **425**   *L* **28**   # 9

Johnson, John   Broadcom

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

Difference in launch power between any two lanes (OMAouter) (max) in Table 183-6 is TBD for 800GBASE-FR4.

SuggestedRemedy

Replace TBD with a value of OMAouter(max) minus OMAouter(min) or 4 dB, whicher is smaller, consistent with other FRn/LRn clauses (122, 151).

Proposed Response   *Response Status* **O**

Cl **181**   *SC* **181.6.2**   *P* **380**   *L* **21**   # 10

Johnson, John   Broadcom

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

Difference in receive power between any two lanes (OMAouter) (max) in Table 181-6 is TBD for 800GBASE-FR4-500.

SuggestedRemedy

Replace TBD with a value of 4.1 dB, consistent with other FR4 PMDs (Cl. 122, 151)

Proposed Response   *Response Status* **O**

Cl **183**   *SC* **183.6.2**   *P* **427**   *L* **21**   # 11

Johnson, John   Broadcom

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

Difference in receive power between any two lanes (OMAouter) (max) in Table 183-7 is TBD for 800GBASE-FR4.

SuggestedRemedy

Replace TBD with a value of 4.1 dB, consistent with other FR4 PMDs (Cl. 122, 151)

Proposed Response   *Response Status* **O**

Cl **183**   *SC* **183.6.1**   *P* **425**   *L* **24**   # 12

Johnson, John   Broadcom

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

The TX must be compliant over the full range of fiber length (dispersion), so the use of TDECQ alone is insufficient to determine Outer Optical Modulation Amplitude (OMAouter), each lane
(min) in Table 183-6 for 800GBASE-FR4/LR4.

SuggestedRemedy

Replace TDECQ with max(TECQ, TDECQ) for both PMDs, as has been done in all other PMDs in Clauses 180-182. Note that max(TECQ, TDECQ) is already in Equation 183-1. For consistency, replace "Equation 183-1" with "-0.1 + max(TECQ, TDECQ)" in Table 183-6, and delete Equation 183-1 on page 435, line 20. Also update Figures 183-3, 183-5, 183-6 and surrounding text with max(TECQ, TDECQ).

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Comment ID* **12**   Page 2 of 118
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   5/3/2024 10:09:27 AM
SORT ORDER: Comment ID

Cl **180**   *SC* **180.8.11**   *P* **365**   *L* **52**   # 13

LeCheminant, Greg   Keysight Technologies

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

The required -3dB BW for the measurement system is not achievable with existing technology. (State of the art power meters with a maximum 120 GHz bandwidth, would require the bandwidth of the photodetetor to be substaitially higher than 120 GHz to achieve the current system bandiwdth required for the test system, as defined in clause 52)

SuggestedRemedy

The bandiwdth of the RIN-OMA test system should be based on the expected bandwidth of the system receivers and consider the expected noise spectrum of transmitters. Spec limits for RIN OMA may need adjustment to adapt to any changes in the test method

Proposed Response   *Response Status* **O**

Cl **181**   *SC* **181.8.11**   *P* **388**   *L* **52**   # 14

LeCheminant, Greg   Keysight Technologies

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

The required -3dB BW for the measurement system is not achievable with existing technology. (State of the art power meters with a maximum 120 GHz bandwidth, would require the bandwidth of the photodetetor to be substaitially higher than 120 GHz to achieve the current system bandiwdth required for the test system, as defined in clause 52)

SuggestedRemedy

The bandiwdth of the RIN-OMA test system should be based on the expected bandwidth of the system receivers and consider the expected noise spectrum of transmitters. Spec limits for RIN OMA may need adjustment to adapt to any changes in the test method

Proposed Response   *Response Status* **O**

Cl **182**   *SC* **182.8.11**   *P* **413**   *L* **10**   # 15

LeCheminant, Greg   Keysight Technologies

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

The required -3dB BW for the measurement system is not achievable with existing technology. (State of the art power meters with a maximum 120 GHz bandwidth, would require the bandwidth of the photodetetor to be substaitially higher than 120 GHz to achieve the current system bandiwdth required for the test system, as defined in clause 52)

SuggestedRemedy

The bandiwdth of the RIN-OMA test system should be based on the expected bandwidth of the system receivers and consider the expected noise spectrum of transmitters. Spec limits for RIN OMA may need adjustment to adapt to any changes in the test method

Proposed Response   *Response Status* **O**

Cl **183**   *SC* **183.8.11**   *P* **437**   *L* **41**   # 16

LeCheminant, Greg   Keysight Technologies

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

The required -3dB BW for the measurement system is not achievable with existing technology. (State of the art power meters with a maximum 120 GHz bandwidth, would require the bandwidth of the photodetetor to be substaitially higher than 120 GHz to achieve the current system bandiwdth required for the test system, as defined in clause 52)

SuggestedRemedy

The bandiwdth of the RIN-OMA test system should be based on the expected bandwidth of the system receivers and consider the expected noise spectrum of transmitters. Spec limits for RIN OMA may need adjustment to adapt to any changes in the test method

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **16**   Page 3 of 118
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Cl **180**	*SC* **180.8.5**	*P* **364**	*L* **23**	# 17

LeCheminant, Greg   Keysight Technologies

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

The current method for optimizing the tap weighs of equalizer in the TDECQ reference receiver is described in clause 121.8.5. The equalizer tap coefficients are iteratively adjusted to effectively minimize the TDECQ penalty. Although not explicitly stated, one way to view this is that ANY combination of tap weights is valid and that ALL combinations should be tried to ensure the optimum tap weight combination is used when calculating TDECQ. As the equalizer length has been increased from 5 taps to 15 taps, the time required to verify all possible tap weights is likely problematic. This issue was managed in the 802.3 db project, where a 9 tap virtual equalizer is used for TDECQ. The following text was added to clause the definition of the TDECQ method: "The lowest measured TDECQ values are achieved with the equalizer optimization method described in 121.8.5. Alternative optimization methods such as minimum mean squared error (MMSE) may be used to determine equalizer tap weights to reduce test time, and are expected to report equal or higher values of TDECQ. These alternative methods should not be used for receiver sensitivity and stressed receiver sensitivity calibration". Note that the MMSE optimization method is used in almost all TDECQ measurements performed today

SuggestedRemedy

Add the following text at line 36 (end of exceptions list): The lowest measured TDECQ values are achieved with the equalizer optimization method described in 121.8.5. Alternative optimization methods such as minimum mean squared error (MMSE) may be used to determine equalizer tap weights to reduce test time, and are expected to report equal or higher values of TDECQ. These alternative methods should not be used for receiver sensitivity and stressed receiver sensitivity calibration

Proposed Response   *Response Status* **O**

Cl **181**	*SC* **181.8.5**	*P* **386**	*L* **41**	# 18

LeCheminant, Greg   Keysight Technologies

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

The current method for optimizing the tap weighs of equalizer in the TDECQ reference receiver is described in clause 121.8.5. The equalizer tap coefficients are iteratively adjusted to effectively minimize the TDECQ penalty. Although not explicitly stated, one way to view this is that ANY combination of tap weights is valid and that ALL combinations should be tried to ensure the optimum tap weight combination is used when calculating TDECQ. As the equalizer length has been increased from 5 taps to 15 taps, the time required to verify all possible tap weights is likely problematic. This issue was managed in the 802.3 db project, where a 9 tap virtual equalizer is used for TDECQ. The following text was added to clause the definition of the TDECQ method: "The lowest measured TDECQ values are achieved with the equalizer optimization method described in 121.8.5. Alternative optimization methods such as minimum mean squared error (MMSE) may be used to determine equalizer tap weights to reduce test time, and are expected to report equal or higher values of TDECQ. These alternative methods should not be used for receiver sensitivity and stressed receiver sensitivity calibration". Note that the MMSE optimization method is used in almost all TDECQ measurements performed today

SuggestedRemedy

Add the following text at line 53 (end of exceptions list): The lowest measured TDECQ values are achieved with the equalizer optimization method described in 121.8.5. Alternative optimization methods such as minimum mean squared error (MMSE) may be used to determine equalizer tap weights to reduce test time, and are expected to report equal or higher values of TDECQ. These alternative methods should not be used for receiver sensitivity and stressed receiver sensitivity calibration

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **18**   Page 4 of 118
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Cl **182**	*SC* **182.8.5**	*P***411**	*L***30**	*#* 19

LeCheminant, Greg   Keysight Technologies

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

The current method for optimizing the tap weighs of equalizer in the TDECQ reference receiver is described in clause 121.8.5. The equalizer tap coefficients are iteratively adjusted to effectively minimize the TDECQ penalty. Although not explicitly stated, one way to view this is that ANY combination of tap weights is valid and that ALL combinations should be tried to ensure the optimum tap weight combination is used when calculating TDECQ. As the equalizer length has been increased from 5 taps to 15 taps, the time required to verify all possible tap weights is likely problematic. This issue was managed in the 802.3 db project, where a 9 tap virtual equalizer is used for TDECQ. The following text was added to clause the definition of the TDECQ method: "The lowest measured TDECQ values are achieved with the equalizer optimization method described in 121.8.5. Alternative optimization methods such as minimum mean squared error (MMSE) may be used to determine equalizer tap weights to reduce test time, and are expected to report equal or higher values of TDECQ. These alternative methods should not be used for receiver sensitivity and stressed receiver sensitivity calibration". Note that the MMSE optimization method is used in almost all TDECQ measurements performed today

SuggestedRemedy

Add the following text at line 44 (end of exceptions list): The lowest measured TDECQ values are achieved with the equalizer optimization method described in 121.8.5. Alternative optimization methods such as minimum mean squared error (MMSE) may be used to determine equalizer tap weights to reduce test time, and are expected to report equal or higher values of TDECQ. These alternative methods should not be used for receiver sensitivity and stressed receiver sensitivity calibration

Proposed Response   *Response Status* **O**

Cl **183**	*SC* **183.8.5**	*P***435**	*L***25**	*#* 20

LeCheminant, Greg   Keysight Technologies

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

The current method for optimizing the tap weighs of equalizer in the TDECQ reference receiver is described in clause 121.8.5. The equalizer tap coefficients are iteratively adjusted to effectively minimize the TDECQ penalty. Although not explicitly stated, one way to view this is that ANY combination of tap weights is valid and that ALL combinations should be tried to ensure the optimum tap weight combination is used when calculating TDECQ. As the equalizer length has been increased from 5 taps to 15 taps, the time required to verify all possible tap weights is likely problematic. This issue was managed in the 802.3 db project, where a 9 tap virtual equalizer is used for TDECQ. The following text was added to clause the definition of the TDECQ method: "The lowest measured TDECQ values are achieved with the equalizer optimization method described in 121.8.5. Alternative optimization methods such as minimum mean squared error (MMSE) may be used to determine equalizer tap weights to reduce test time, and are expected to report equal or higher values of TDECQ. These alternative methods should not be used for receiver sensitivity and stressed receiver sensitivity calibration". Note that the MMSE optimization method is used in almost all TDECQ measurements performed today

SuggestedRemedy

Add the following text at line 40 (end of exceptions list): The lowest measured TDECQ values are achieved with the equalizer optimization method described in 121.8.5. Alternative optimization methods such as minimum mean squared error (MMSE) may be used to determine equalizer tap weights to reduce test time, and are expected to report equal or higher values of TDECQ. These alternative methods should not be used for receiver sensitivity and stressed receiver sensitivity calibration

Proposed Response   *Response Status* **O**

Cl **176**	*SC* **176**	*P***242**	*L***10**	*#* 21

Liu, Cathy   Broadcom

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

In this section, precoding is mentioned to CR, KR and C2C links. How about C2M link? It should add C2M since C2M LT session specifies precoding as one of the options.

SuggestedRemedy

Add C2M link into the statement: "The precoding specifications in this subclause apply to the input and output lanes of a PMA that are connected to the service interface of an xBASE-CRn or xBASE-KRn PMD, or are part of an xAUI-n C2C/C2M link."

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **21**

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Cl **177**   *SC* **177**   *P***257**   *L***28**   # 22

Liu, Cathy   Broadcom

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

This section only mentions that the inner FEC decoder is soft-decision decoder and the details implementation is beyond the scope of the this standard. However, shall we specify the soft-decision decoder's performance bound? If not, the optical PMD BER target or link budget might be missed.

SuggestedRemedy

To specify the soft-decision decoder shall provide TBD dB (say 2dB) coding gain over end-end FEC provided that the error statistics are sufficiently random.

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178**   *P***270**   *L***17**   # 23

Liu, Cathy   Broadcom

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

Table 178-4 "120F-1.6TGAUI-16 C2C'

SuggestedRemedy

change to "120F-1.6TAUI-16 C2C'

Proposed Response   *Response Status* **O**

Cl **179A**   *SC* **179A**   *P***664**   *L*   # 24

Liu, Cathy   Broadcom

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

Figure 179A-1 and figure 179A-2 are not showing completely in my PDF file

SuggestedRemedy

Proposed Response   *Response Status* **O**

Cl **179B**   *SC* **179B**   *P***670**   *L*   # 25

Liu, Cathy   Broadcom

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

Figure 179B-1 figure is not showing completely in my PDF file

SuggestedRemedy

Proposed Response   *Response Status* **O**

Cl **179B**   *SC* **179B**   *P***672**   *L*   # 26

Liu, Cathy   Broadcom

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

Figure 179B-2 figure is not showing completely in my PDF file

SuggestedRemedy

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.9.2**   *P***276**   *L***34**   # 27

Mellitz, Richard   Samtec

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

adjust SNDR with loss correction factor which is about 1 dB basd on prior assumptions

SuggestedRemedy

change SNDR to 33,5 dB.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID   *Comment ID* **27**   Page 6 of 118
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Cl **178**   *SC* **178.9.2.1.2**   *P* **277**   *L* **37**   # 28

Mellitz, Richard   Samtec

Comment Type **TR**   *Comment Status* **X**
  scale ERL parameter form 0.3ck

SuggestedRemedy
  in table 178-7 change TBD's as follows
  Tr 0.005 ns
  βx 0 GHz
  ρx 0.618
  N 400 UI

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.9.2.2**   *P* **278**   *L* **26**   # 29

Mellitz, Richard   Samtec

Comment Type **TR**   *Comment Status* **X**
  scale ERL parameter form 0.3ck

SuggestedRemedy
  in table 163-7 change TBD's as follows
  Tr 0.005 ns
  βx 0 GHz
  ρx 0.618
  N 400 UI

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.9.2.4**   *P* **279**   *L* **4**   # 30

Mellitz, Richard   Samtec

Comment Type **TR**   *Comment Status* **X**
  The baud rate has doubled from .3ck,. If loading is scaled down with the baud rate, the
  physical setting time would remain unchanged. Adjust Nv and Dp accordingly.

SuggestedRemedy
  Change Nv=TBD to Nv=400

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.9.2.6**   *P* **279**   *L* **22**   # 31

Mellitz, Richard   Samtec

Comment Type **TR**   *Comment Status* **X**
  adjust SCMR with loss correction factor

SuggestedRemedy
  add + loss correction factor to equation 178-1

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.9.3.3**   *P* **281**   *L* **41**   # 32

Mellitz, Richard   Samtec

Comment Type **TR**   *Comment Status* **X**
  The Bessel-Thomson filter should track fr which betwee 0.5 and 0.6 has been shown in
  presenations.

SuggestedRemedy
  change TBD to 67GHz

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.10**   *P* **284**   *L* **11**   # 33

Mellitz, Richard   Samtec

Comment Type **TR**   *Comment Status* **X**
  Use 3 dB as minimum COM as in .3ck or

SuggestedRemedy
  change TBD to 3 (same in 178.10.1 line 28)

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

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Cl **178**   *SC* **178.10**   *P* **284**   *L* **12**   # 34

Mellitz, Richard   Samtec

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

reference is wrong and Ildd should reflect tp0d to tp05d.

SuggestedRemedy

change reference to 178.10.2
and TBD to 40 dB
or eliminate the reference to Ildd

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.10.1**   *P* **285**   *L* **38**   # 35

Mellitz, Richard   Samtec

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

(Table 178–12): Computation can be independent of R0. Add a note to explain. S parameter can utilize any R0. For computation purposes s-parameters are converted to 50 ohms which is the native impedance for the most common test equipment.

SuggestedRemedy

Change R0 for TBD to 50 ohms and add a note indicating the imported s-parameter are to be converted into 50 ohm reference before computation.

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.10.1**   *P* **286**   *L* **12**   # 36

Mellitz, Richard   Samtec

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

T(able 178–13) Presentations so far have used fr of 0.5, 0.55, 0.58, and 0.6. 67 Ghz limits on test equipment and cabling/connector modal physics suggest at least a 9 dB loss is required for good measurements at 67 GHz. Set fr to 0.6 or lower to achieve this.

SuggestedRemedy

change TBD to 0.6.

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.10.1**   *P* **286**   *L* **18**   # 37

Mellitz, Richard   Samtec

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

Presentations so for have not shown the need for Tx FFE. Change to no TXFFE until further data is provided.
Rx noise may suggest a need for the TXFFE which would improve performance. It's not clear from a channel perspective that the TX FFE is not a zero sum gain compared to the Rx noise loss of COM. Until Rx FFE noise is better defined zero out TxFFE.

SuggestedRemedy

Change TBDs for c(-3),c(-2),c(-1), and c(1) to zero. Set C(0) tp 1.

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.10.1**   *P* **286**   *L* **46**   # 38

Mellitz, Richard   Samtec

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

It not clear the power sources have significantly changed from 0.3ck and to avoid the complication of small voltage requirement from packages use the 0.3ck voltages.

SuggestedRemedy

set Av and Afe to 0.413 and Ane to 0.608

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.10.1**   *P* **286**   *L* **50**   # 39

Mellitz, Richard   Samtec

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

scale Tr from .3ck. Understand that this is not the Tr at TP0d.

SuggestedRemedy

set Tr to 0.00375 ns

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **39**

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Cl **178**   *SC* **178.10.2**   *P* **287**   *L* **37**   # 40

Mellitz, Richard   Samtec

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

Define the channel insertion loss to include the package i.e TP0d to TP5d.

SuggestedRemedy

change TBD to 40 dB

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.10.2**   *P* **287**   *L* **5**   # 41

Mellitz, Richard   Samtec

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

SNR_TX can be SNDR when loss correction is employed

SuggestedRemedy

Change TBD to 33.5 dB

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.10.2**   *P* **287**   *L*   # 42

Mellitz, Richard   Samtec

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

Selecting values the "Receiver discrete-time equalizer parameters" are critical for making progress. Many presentations a have shown quite a variation. Select values based on what seems consistent or use straw ballot to determine.

SuggestedRemedy

use straw polls from the following
Dw 4, 6, or 8
Nfix 10, 15, 24
Ng 1, 2, 3
Nf 3, 4, 5
Nmax 40 60 120
Wmax(j)=1
Wmin(-1,0,1)=0. otherwise -0.5
bmax(1) = 0,5 0.75 0 85
bmin(1)= 0 -0,5 -0.75 -0 85

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.10.3**   *P* **288**   *L* **29**   # 43

Mellitz, Richard   Samtec

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

scale ERL parameter form 0.3ck

SuggestedRemedy

in table 178-14 change TBD's as follows
Tr 0.005 ns
βx 0 GHz
ρx 0.618
N 7000 UI

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.9.4.1.1**   *P* **312**   *L* **2**   # 44

Mellitz, Richard   Samtec

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

The baud rate has doubled from .3ck,. If loading is scaled down with the baud rate, the physical setting time would remain unchanged. Adjust Np and Dp accordingly.

SuggestedRemedy

Change Np from 200 to 400. change Dp from 4 to 8.

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.9.4.1.1**   *P* **312**   *L* **42**   # 45

Mellitz, Richard   Samtec

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

SNDR reduces with loss and used that way for equation 178A–18.

SuggestedRemedy

Insert a subsection e)   Loss correction factor for fitted pulse measurements. See presentation

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **45**

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Cl **179**   *SC* **179.9.4.1.2**   *P* **312**   *L* **53**   # 46

Mellitz, Richard   Samtec

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

scale Nv from .3ck

SuggestedRemedy

change Nv to 400

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.9.4.6**   *P* **315**   *L* **17**   # 47

Mellitz, Richard   Samtec

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

SNDR reduces with loss and used that way for equation 178A–18.

SuggestedRemedy

change
The transmitter SNDR is defined by the measurement method described in 120D.3.1.6
to
The transmitter SNDR is defined by the measurement method described in 120D.3.1.6 plus a power loss factor defined in xxxx

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.9.4.8**   *P* **315**   *L* **41**   # 48

Mellitz, Richard   Samtec

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

scale ERL parameter form 0.3ck

SuggestedRemedy

in table 163-7 change TBD's as follows
Tr 0.005 ns
βx 0 GHz
ρx 0.618
N 1600 UI

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.9.5.3**   *P* **319**   *L* **22**   # 49

Mellitz, Richard   Samtec

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

The COM values need to be set to make progress. Until a more comprehensive proposal is presented use what is in 0.3ck and many other prior standards

SuggestedRemedy

set COM to 3 dB

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.11**   *P* **326**   *L* **21**   # 50

Mellitz, Richard   Samtec

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

The COM values need to be set to make progress. Until a more comprehensive proposal is presented use what is in 0.3ck and many other prior standards

SuggestedRemedy

set COM to 3 dB

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.11.3**   *P* **327**   *L* **41**   # 51

Mellitz, Richard   Samtec

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

The data rate was doubled and cable length was scale by a factor of 2 from .3ck. Adjust ERL parameters accordingly

SuggestedRemedy

in table 179-14 change TBD's as follows
Tr 0.005 ns
βx 0 GHz
ρx 0.618
N 4500 UI

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **51**

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Cl **179**   *SC* **179.11.7**   *P* **331**   *L* **43**   # 52

Mellitz, Richard   Samtec

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

(Table 179–15): Computation can be independent of R0. Add a note to explain. S parameter can utilize any R0. For computation purposes s-parameters are converted to 50 ohms which is the native impedance for the most common test equipment.

SuggestedRemedy

Change R0 for TBD to 50 ohms and add a note indicating the imported s-parameter are to be converted into 50 ohm reference before computation.

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.11.7**   *P* **332**   *L* **12**   # 53

Mellitz, Richard   Samtec

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

T(able 179–16) Presentations so far have used fr of 0.5, 0.55, 0.58, and 0.6. 67 Ghz limits on test equipment and cabling/connector modal physics suggest at least a 9 dB loss is required for good measurements at 67 GHz. Set fr to 0.6 or lower to achieve this.

SuggestedRemedy

change TBD to 0.6.

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.11.7**   *P* **333**   *L* **11**   # 54

Mellitz, Richard   Samtec

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

(table 179-16)Selecting values the "Receiver discrete-time equalizer parameters" are critical for making progress. Many presentations a have shown quite a variation. Select values based on what seems consistent or use straw ballot to determine.

SuggestedRemedy

use straw polls from the following
Dw 4, 6, or 8
Nfix 10, 15, 24
Ng 1, 2, 3
Nf 3, 4, 5
Nmax 40 60 120
Wmax(j)=1
Wmin(-1,0,1)=0. otherwise -0.5
bmax(1) = 0,5 0.75 0 85
bmin(1)=   0 -0,5 -0.75 -0 85

Proposed Response   *Response Status* **O**

Cl **93B**   *SC* **93B**   *P* **520**   *L* **6710**   # 55

Mellitz, Richard   Samtec

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

We have been talking about "die-to-die" loss for while now. Add at test point reference to this and reference to section Annex 93B. One reference to this is in diminico_3dj_01_2307 slide 6 and 7.

SuggestedRemedy

Add TP0d and TP5d to figure 93B-1 and table 93B-1

Proposed Response   *Response Status* **O**

Cl **179A**   *SC* **179A.2**   *P* **662**   *L* **6710**   # 56

Mellitz, Richard   Samtec

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

Refence to a diagram with TP0d and TP5d is required

SuggestedRemedy

Add TP0d and TP5d to figure 93B-1 and table 93B-1

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **56**

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Cl **179A**   *SC* **179A.7**   *P* **668**   *L* **12**   # 57

Mellitz, Richard   Samtec

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

The COM values need to be set to make progress. Until a more comprehensive proposal is presented use what is in 0.3ck and many other prior standards

SuggestedRemedy

set COM to 3 dB

Proposed Response   *Response Status* **O**

Cl **179B**   *SC* **179B.4.2**   *P* **673**   *L* **13**   # 58

Mellitz, Richard   Samtec

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

scale ERL parameter form 0.3ck

SuggestedRemedy

in table 178-14 change TBD's as follows
Tr 0.005 ns
βx 0 GHz
ρx 0.618
N 1600 UI
Tfx 0
tw 1
DER0 2e-5

Proposed Response   *Response Status* **O**

Cl **179B**   *SC* **179B.4.26**   *P* **676**   *L* **41**   # 59

Mellitz, Richard   Samtec

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

At least the symbol rate is known

SuggestedRemedy

set fb to 106.25 GBd

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.9.2**   *P* **275**   *L* **48**   # 60

Mellitz, Richard   Samtec

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

The Bessel-Thomson filter should track fr. Between 0.5 fb and 0.6 fb have been shown in presenations.

SuggestedRemedy

change TBD to 67GHz

Proposed Response   *Response Status* **O**

Cl **176A**   *SC* **176A.4**   *P* **555**   *L* **17**   # 61

Dudek, Mike   Marvell

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

It would be better to have the existing patterns the same as for previous clause 136.

SuggestedRemedy

In Table 176A-3 use the 1 in bit 12 for the new patterns keeping the bits 11 and 10 the same as they were in clause 136 i.e. change 010 to PAM4 PRBS13, 100 to PAM4 free running PRBS13, 011 to PAM4 PRB13 with precoding and 110 to PAM4 free-running PRBS31

Proposed Response   *Response Status* **O**

Cl **176D**   *SC* **176D.2**   *P* **596**   *L* **19**   # 62

Dudek, Mike   Marvell

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

The note "The electrical specifications of C2C components are not equivalent to those of the corresponding PMD's isn't helpful. What does "not equivalent" mean?. Which corresponding PMD's?

SuggestedRemedy

Delete the note.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **62**   Page 12 of 118
5/3/2024 10:09:27 AM

Cl **176D**   *SC* **176D.4.2**   *P* **607**   *L* **31**   # 63

Dudek, Mike   Marvell

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

An insertion loss of only 20dB is less than desirable and the equation is TBD. We shouldn't specify the loss at this time

SuggestedRemedy

Change 20dB to TBD.

Proposed Response   *Response Status* **O**

Cl **176E**   *SC* **176E.2**   *P* **615**   *L* **20**   # 64

Dudek, Mike   Marvell

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

The note "The electrical specifications of C2C components are not equivalent to those of the corresponding PMD's. Specifically the test points at which module compliance is defined are different isn't helpful. What does "not equivalent" mean?. Which corresponding PMD's?   Although the module test points are different those for the host are the same as Clause 179.

SuggestedRemedy

Delete the note.

Proposed Response   *Response Status* **O**

Cl **176E**   *SC* **176E.5.2**   *P* **634**   *L* **8**   # 65

Dudek, Mike   Marvell

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

There shouldn't be any Tx parameters in a specification for a reference receiver.

SuggestedRemedy

Delete the rows for transmitter termination resistance, transmitter equalizer coefficients, transmitter differential peak output voltage, transition time, transmitter signal to noise ratio, RLM,

Proposed Response   *Response Status* **O**

Cl **120**   *SC* **120.1.1a**   *P* **114**   *L* **30**   # 66

Dudek, Mike   Marvell

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

Table 116-1 and Table 116-2 include the 200Gb/s per lane PMDs which require the symbol muxing PMA. This bit muxing PMA would only be used for lower speed AUIs. Saying it supports any of the PMDs in the tables is confusing.

SuggestedRemedy

Change to "The 200GBASE-R PMA(s) can support any of the two, or four lane 200Gb/s PMDs in Table116–1 and the 400GBASE-R PMA(s) can support
any of the four, or 8 lane 400Gb/s PMDs in Table 116–2".   As a less preferred apporach PMD's could be changed to PHYs in the original sentence and an additional sentence could be added saying "The single lane 200Gb/s PMDs in Table 116-1 and the two lane 400Gb/s in table 115-2 require the symbol-muxing PMAs described in clause 176."

Proposed Response   *Response Status* **O**

Cl **120F**   *SC* **120F.1**   *P* **522**   *L* **7**   # 67

Dudek, Mike   Marvell

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

Clause 176 is for the symbol mux PMA it should not be used for Annex 120F

SuggestedRemedy

Remove the reference to 176.9.1.2

Proposed Response   *Response Status* **O**

Cl **169**   *SC* **169.1.4**   *P* **118**   *L* **22**   # 68

Dudek, Mike   Marvell

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

There are errors in Table 169-3. 800GBASE-DR8-PMD is not needed for 800GBASE-DR4 or 800GBASE-FR4-500, 800GBASE-DR8-2 PMD is not needed for 800GBASE-DR4-2, 800GBASE-FR4, or 800GBASE-LR4,

SuggestedRemedy

Delete the offending "M"s

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **68**   Page 13 of 118
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Cl **169**   *SC* **169.1.4**   *P***118**   *L***22**   # 69

Dudek, Mike   Marvell

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

There are errors in Table 169-3. 800GBASE-DR8-PMD is not needed for 800GBASE-DR4 or 800GBASE-FR4-500, 800GBASE-DR8-2 PMD is not needed for 800GBASE-DR4-2, 800GBASE-FR4, or 800GBASE-LR4,

SuggestedRemedy

Delete the offending "M"s

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.11.7**   *P***332**   *L***12**   # 70

Lusted, Kent   Intel Corporation

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

The COM parameter values for the 200GBASE-CR1, 400GBASE-CR2, 800GBASE-CR4 and 1.6TBASE-CR8 PMDs are TBDs

SuggestedRemedy

In table 179-16, Use the COM parameter values from https://www.ieee802.org/3/dj/public/24_01/healey_3dj_01_2401.pdf slide 18, which are:

$f\_r = 0.58$
$c(-3) = 0$
$c(-2) = 0$
$c(-1) = 0$
$c(0) = 1$
$c(1) = 0$
$A\_v = 0.413$
$A\_fe = 0.413$
$A\_ne = 0.45$
$eta\_0 = 6e-9$
$SNR\_TX = 33$
$sigma\_RJ = 0.01$
$A\_DD = 0.02$
$R\_LM = 0.95$
$d\_w = 5$
$Nfix = 10$
$N\_g = 0$
$N\_f = 0$
$N\_max = 0$
$b\_max(1) = 0.85$
$b\_min(1) = 0$

additionally, set MLSE = 0 (not enabled)

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Comment ID* **70**   Page 14 of 118
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   5/3/2024 10:09:27 AM
SORT ORDER: Comment ID

Cl **178**   *SC* **178.10.1**   *P***286**   *L***12**   # 71

Lusted, Kent   Intel Corporation

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

The COM parameter values for the 200GBASE-KR1, 400GBASE-KR2, 800GBASE-KR4 and 1.6TBASE-KR8 PMDs are TBDs

SuggestedRemedy

In table 178-13, use the COM parameter values from https://www.ieee802.org/3/dj/public/24_01/healey_3dj_01_2401.pdf slide 18, which are:

$f\_r = 0.58$
$c(-3) = 0$
$c(-2) = 0$
$c(-1) = 0$
$c(0) = 1$
$c(1) = 0$
$A\_v = 0.413$
$A\_fe = 0.413$
$A\_ne = 0.45$
$eta\_0 = 6e-9$
$SNR\_TX = 33$
$sigma\_RJ = 0.01$
$A\_DD = 0.02$
$R\_LM = 0.95$
$d\_w = 5$
$Nfix = 10$
$N\_g = 0$
$N\_f = 0$
$N\_max = 0$
$b\_max(1) = 0.85$
$b\_min(1) = 0$

additionally, set MLSE = 0 (not enabled)

Proposed Response   *Response Status* **O**

Cl **176E**   *SC* **176E.4.2**   *P***605**   *L***50**   # 72

Lusted, Kent   Intel Corporation

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

The COM parameter values for the AUI C2M electrical interfaces in Annex 176E are different from the AUI C2C

SuggestedRemedy

Create a new COM parameter values table in 176E.4.2 and use the COM parameter values from https://www.ieee802.org/3/dj/public/24_03/lit_3dj_01a_2403.pdf slide 6 and 11, which are:

$f\_r = 0.58$
$c(-3) = 0$
$c(-2) = 0$ min, 0.12 max
$c(-1) = -0.4$ min, 0 max
$c(0) = 0.54$
$c(1) = 0$
$A\_v = 0.413$
$A\_fe = 0.413$
$A\_ne = 0.45$
$eta\_0 = 1.25e-8$
$SNR\_TX = 33$
$sigma\_RJ = 0.01$
$A\_DD = 0.02$
$R\_LM = 0.95$
$d\_w = 5$
$Nfix = 10$
$N\_g = 1$
$N\_f = 4$
$N\_max = 60$
$w\_max(1) = 1$
$w\_min(1) = 0$
$b\_max(1) = 0.75$
$b\_min(1) = 0$

additionally, set MLSE = 0 (not enabled)

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Comment ID* **72**   Page 15 of 118
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   5/3/2024 10:09:27 AM
SORT ORDER: Comment ID

Cl **176E**　　　*SC* **176E.4.1**　　　　*P* **632**　　　　*L* **6**　　　# 73

Lusted, Kent　　　　　　　　　　　Intel Corporation

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

The IL_dd for AUI C2M channel is a TBD

SuggestedRemedy

Set IL_dd = 33 per https://www.ieee802.org/3/dj/public/24_01/lusted_3dj_03_2401.pdf

Proposed Response　　　*Response Status* **O**

Cl **1**　　　*SC* **1.5**　　　　*P* **51**　　　　*L* **11**　　　# 74

Lusted, Kent　　　　　　　　　　　Intel Corporation

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

The abbreviation "MLSD" is used numerous times in Annex 178A to reference Maximum Likelihood Sequence Detection and should be added to the abbreviations list.

SuggestedRemedy

Add MLSD | Maximum Likelihood Sequence Detection

Proposed Response　　　*Response Status* **O**

Cl **30**　　　*SC* **30.3.2.1.3**　　　　*P* **53**　　　　*L* **21**　　　# 75

Huber, Thomas　　　　　　　　　　Nokia

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

There should also be an entry for 800GBASE-ER1 since it is a different PCS

SuggestedRemedy

Add a new editing instruction to insert 800GBASE-ER1 after 400GBASE-R (or before the entry for 800GBASE-R).

Proposed Response　　　*Response Status* **O**

Cl **169**　　　*SC* **169.1.3**　　　　*P* **116**　　　　*L* **43**　　　# 76

Huber, Thomas　　　　　　　　　　Nokia

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

The descriptions of 800GBASE-ER1-20 and 800GBASE-ER1 should refer to 800GBASE-ER1 encoding rather than 800GBASE-R encoding since the ER1[-20] PCS is distinct from the 800GBASE-R PCS

SuggestedRemedy

Change 800GBASE-R to 800GBASE-ER1 in the last two rows of the table.

Proposed Response　　　*Response Status* **O**

Cl **169**　　　*SC* **169.1.4**　　　　*P* **119**　　　　*L* **20**　　　# 77

Huber, Thomas　　　　　　　　　　Nokia

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

The 800GXS can contain AUIs - so the C2C and C2M clauses should be marked as optional for the ER1 and ER1-20 PHYs, as should the associated PMAs.

SuggestedRemedy

Indicatge that 800GBASE-R BM-PMA, 800GAUI-8 C2C, 800GAUI-8 C2M, 800GBASE-R SM-PMA, 800GAUI-4 C2C, and 800GAUI-4 C2M are optional for both ER1 and ER1-20 PHYs.

Proposed Response　　　*Response Status* **O**

Cl **169**　　　*SC* **169.3.2**　　　　*P* **122**　　　　*L* **35**　　　# 78

Huber, Thomas　　　　　　　　　　Nokia

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

A similar diagram is needed for 800GBASE-ER1 and 800GBASE-ER1-20 PHYs.

SuggestedRemedy

Use figure 169-2b as a basis. Replace 800GBASE-R PCS with 800GBASE-ER1 PCS, 800GBASE-LR1 Inner FEC with 800GBASE-ER1 PMA, and 800GBASE-R PMD with 800GBASE-ER1 PMD (and of course renams all the service interfaces to align with that).

Proposed Response　　　*Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected　　　RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **78**　　　Page 16 of 118
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Cl **171**　　*SC* **171.8**　　　　　*P* **144**　　　*L* **23**　　　# 79

Huber, Thomas　　　　　　　　　Nokia

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

In tables 171-3 and 171-5, it is not clear what has changed in the rows that are shown.

SuggestedRemedy

Indicate the changes with revision marks

Proposed Response　　　*Response Status* **O**

Cl **176**　　*SC* **176.6.1**　　　　*P* **213**　　　*L* **5**　　　# 80

Huber, Thomas　　　　　　　　　Nokia

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

The 800G 32:4 PMA, 400G 16:2 PMA and the 200G 8:1 PMA are basically the same, other than the numbers of lanes. The 1.6T 16:8 is different since it has 40b deskew and 4-symbol interleaving. All of the PMAs with the same number of lanes on both sides are essentially the same. It would simplify maintenance and likely reader understanding as well if the number of lanes were parameterized as m and n

SuggestedRemedy

Reorganize 176.5 through 176.8 into 3 clauses: one for 200/400/800 m:n PMAs, one for 1.6T m:n PMAs, and one for 200/400/800/1.6T m:m PMAs, and use a single set of text and figures with the parameters m and n for the number of lanes. Include a table showing PHY rates and the values of m an n (e.g, with columns PHY, m, and n, and rows 200GBASE-R, 8, 1; 400GBASE-R, 16, 2; etc.).

Proposed Response　　　*Response Status* **O**

Cl **177**　　*SC* **177.1.3**　　　　*P* **249**　　　*L* **10**　　　# 81

Huber, Thomas　　　　　　　　　Nokia

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

The second bullet could be written more clearly

SuggestedRemedy

Revise to read "Distributing (collecting) the convolutional interleaved data to (from) eight Inner FEC flows

Proposed Response　　　*Response Status* **O**

Cl **177**　　*SC* **177.1.3**　　　　*P* **249**　　　*L* **14**　　　# 82

Huber, Thomas　　　　　　　　　Nokia

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

The fifth bullet could be written more clearly

SuggestedRemedy

Revise to read "8:1 interleaving (1:8 deinterleaving) the eight Inner FEC flows to (from) a single flow"

Proposed Response　　　*Response Status* **O**

Cl **177**　　*SC* **177.1.4**　　　　*P* **250**　　　*L* **25**　　　# 83

Huber, Thomas　　　　　　　　　Nokia

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

Indicating PAM4 decoding as optional seems a bit misleading. The P{MD isn't doing soft-decoding in any case, so the FEC must do some sort of decoding to recover the bits from the PAM4 symbols.

SuggestedRemedy

Generalize the label in the box to "Decoding", and explain in the text in 177.5.x that there are multiple options for decoding.

Proposed Response　　　*Response Status* **O**

Cl **177**　　*SC* **177.4.6**　　　　*P* **254**　　　*L* **44**　　　# 84

Huber, Thomas　　　　　　　　　Nokia

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

The last parargaph on p254 is not necessary - implementations are always free to do things in different orders, as long as the end result matches the specified behavior.

SuggestedRemedy

Delete the paragraph.

Proposed Response　　　*Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected　　RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **84**　　　Page 17 of 118
5/3/2024 10:09:27 AM

Cl **177**   *SC* **177.5**   *P* **256**   *L* **24**   # 85

Huber, Thomas   Nokia

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

According to figure 177-2, the first process the receiver performs is PAM4 decoding (or soft-decision decoding).

SuggestedRemedy

Add a subclause for the decoding process.

Proposed Response   *Response Status* **O**

Cl **177**   *SC* **177.5.1**   *P* **256**   *L* **25**   # 86

Huber, Thomas   Nokia

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

This subclause is confusing and seems to be prescribing a specific implementation. The goal of the process is to find codeword boundaries and remove the pad. If we simply reverse the processes of the tx, this process would (in a logical sense) be performed on the interleaved stream, and would search for the (intereleaved) FS pattern

SuggestedRemedy

Rewrite the text to describe searching for the FS pattern and finding it at the expected interval

Proposed Response   *Response Status* **O**

Cl **184**   *SC* **184.2**   *P* **443**   *L* **7**   # 87

Huber, Thomas   Nokia

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

Other diagrams of this type do not have dashed boxes areound the transmit and received processes.

SuggestedRemedy

For consisetncy with the rest of the document, remove the dashed boxes

Proposed Response   *Response Status* **O**

Cl **184**   *SC* **184.2**   *P* **444**   *L* **5**   # 88

Huber, Thomas   Nokia

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

The second sentence of the paragraph (dsicussing the distribution to 32 lanes by the permutation function) sems to imply that the 32 lanes were interleaved into a serial stream after they were reordered and deskewed, but the text doesn't actually say that is done.

SuggestedRemedy

If the intent is that the 32 lanes are re-interleaved, and then the permutation function distributes the symbols back to 32 lanes (in something other than a round-robin manner), change the end of the first sentence to say "…reordered, deskewed, and serialized". If the intent is that the permutation process just moves symbols around among the 32 lanes, change the second sentence to say "The RS-FEC symbols are then rearranged across the 32 lanes by a permutation function.".

Proposed Response   *Response Status* **O**

Cl **184**   *SC* **184.4.1**   *P* **445**   *L* **5**   # 89

Huber, Thomas   Nokia

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

There are always many implementation options, but we don't have to describe them in the document, we just have to describe the behavior that is required.

SuggestedRemedy

Delete "when implemented" from the first sentence, and delete the second paragraph.

Proposed Response   *Response Status* **O**

Cl **184**   *SC* **184.4.1**   *P* **445**   *L* **12**   # 90

Huber, Thomas   Nokia

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

What is the purpose of this mapping? There are 32 lanes being received; this process is simply aligning them based on the RS FEC frame, so it doesn't seem like a.mapping is needed.

SuggestedRemedy

Either explain why this mapping process is needed, or delete it.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID
Comment ID **90**   Page 18 of 118   5/3/2024 10:09:28 AM

Cl **184** *SC* **184.4.2** *P* **445** *L* **22** # 91

Huber, Thomas   Nokia

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

Lane reordering is not optional; the lanes have to be put in the correct order. If they happen to arrive in the correct order, it's a simple process.

SuggestedRemedy

Change the second sentence to say "The lane reorder process shall order the PCS lanes according to the PCS lane number."

Proposed Response *Response Status* **O**

Cl **184** *SC* **184.4.2** *P* **445** *L* **26** # 92

Huber, Thomas   Nokia

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

It is not clear why this description is needed. Other clauses about reordering don't have this.

SuggestedRemedy

Delete the last paragraph

Proposed Response *Response Status* **O**

Cl **184** *SC* **184.4.3** *P* **446** *L* **1** # 93

Huber, Thomas   Nokia

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

This figure is not clear, nor is the relatoinship of the figure to the pseudocode beneath it. I think the columns 0-3 are just numbers that relate to the post-FEC distribution process. I have no idea why there are 32 sets of 4 symbols, as the algorithm doesn't do anything on a four-symbol basis. The function is simply reversing flow1 and flow0 every two columns, so that each lane has interleaved symbols from all four codewords. This could be described more simply by using blocks of 16 symbols in the figure (i.e.., block 0 would be lanes 0-15 in column 0, block 1 would be lanes 16-31 in column 0, etc.).

SuggestedRemedy

Revise the figure as suggested. The input side would look like this (where each row here is corresponding to 16 PCS lanes i nthe figure):
0 2 4 6
1 3 5 7
and the output would be
0 2 5 7
1 3 4 6

This will remove any confusion about whether the 32 blocks are supposed to be somehow related to the 32 PCS lanes, and it will be it easier to see what is changing between the figures.

Proposed Response *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **93**

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5/3/2024 10:09:28 AM

Cl **184**   *SC* **184.4.3**   *P* **446**   *L* **45**   # 94

Huber, Thomas   Nokia

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

The algorithm is unnecessarily complex. There is no need for bit-level detail since the operation is performed on 10-bit symbols - though really it seems to be performed on 160-bit entities. Per figure 184-3, it's essentially receiving as input alternating sets of 160 bits from flow0 and flow1, and changing the order from 0, 1, 0, 1, 0, 1, 0, 1 to 0, 1, 0, 1, 1, 0, 1, 0.

SuggestedRemedy

A minimal change would be to state that the algorithm operates on 10-bit symbols, delete the for j… loop and its terminator, and replace "10i+j" with "I" in the statement that describes the permutation..

Another option would be to rewrite the description around the 160-bit entities as described, and perhaps also change the figure to show those instead of 40-bit entities (which as noted in a previous comment seem to have no relevance to this process, or to the convolutional interleaver process that follows it).

Proposed Response   *Response Status*   **O**

Cl **184**   *SC* **184.4.4**   *P* **447**   *L* **22**   # 95

Huber, Thomas   Nokia

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

The description of the convolutional interleaver process could be improved. The variable i is used in the first part of the subclause as an index for the delay lines and as an indication of time within a sequence. Then at the bottom of page 447 it's used a symbol index.

SuggestedRemedy

Revise the list above the figure to read as follows, eliminating the overleading of the index i and improcing the clarity a bit (and change the figure to label the lines as b=0, b=1, b-2)::
a) The input and output switches are always aligned to the same row b, where b = 0 to 2
b) a block of 40 bits is read from row b
c) The concents of row b are shifted to the right by 40 bits
d) A block of 40 bits is written to row b
e) The switch position is updated to (b+1) mod 3

Proposed Response   *Response Status*   **O**

Cl **184**   *SC* **184.4.4**   *P* **447**   *L* **48**   # 96

Huber, Thomas   Nokia

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

Since the convolutional interleaver operates separately on each PCS lane, there's no value in having an algorithm that includes the PCS lanes. Since it operates on 40-bit units, there's also no need to include bit-level description.

SuggestedRemedy

State that the algorithm describes the operation on the 40 bit entities and is run on each PCS lane independently. This allows elimination of the p and j variables.

Proposed Response   *Response Status*   **O**

Cl **184**   *SC* **184.4.4**   *P* **448**   *L* **3**   # 97

Huber, Thomas   Nokia

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

The algorithm relating the convolutional interleaver output to its input doesn't work when i<36 - it refers to negative block numbers for the input (permo) whlie the delay lines are filling, and those negative numbers need to be ignored as the process starts up. In other words, given the input sequence of 40-bit blocks 0, 1, 2, 3, …, the convolutional interleaver is supposed to produce the output sequence 0, 3, 6, 9, 12, 15, 18, 1, 21, 4, 24, 7, 27, 10, 30, 13, 33, 16, then 36, 19, 2, and then each successive set of 3 is 3 more than the previous (so it continues 39, 22, 5, 42, 25, 8, ...). The algorithm says that output 0 is input 0-18 x (0 mod 3), so that produces 0 as expected, but output 1 is then supposed to be input 1-18 x (1 mod 3), which is -17, not 3.

SuggestedRemedy

The text above figure 184-4 already provides an algorithmix description of how the interleaver works. Rather than a second algorithmic description, it might be better to show the worked example as noted in the comment - i.e., show a table of input blocks from 0 to 42, and the corresponding output blocks.

Proposed Response   *Response Status*   **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **97**

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5/3/2024 10:09:28 AM

Cl **184**   *SC* **184.4.5**   *P***448**   *L***12**   # 98

Huber, Thomas   Nokia

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

The first statement should not be a 'shall' (which indicates a PICS item of conformance). The second sentence is correct, in that there are 32 encoders, but what's actually required is that each lane has an encoder.

SuggestedRemedy

Revise the paragraph to read: The BCH encoder works in conjunction with the RS(544,514) FEC to increase the FEC coding gain. There is a BCH encoder process for each PCS lane.

Proposed Response   *Response Status* **O**

Cl **184**   *SC* **184.4.5**   *P***448**   *L***40**   # 99

Huber, Thomas   Nokia

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

The variable p is being overloaded - it is used at line 35 as a lane index, and at line 40 as the parity polynomial. Since the BCH encoding is done per lane, there is really no need to have a variable related to the lane number. The text can simply state that the algorithm is applied to each lane individually.

SuggestedRemedy

Change the line above the dashed list to say "The BCH encoding is done separately on each lane. The encoding of of each BCH codeword u is deined as follows:

At the top of page 449, remove the 'for p…' loop from the pseudocode.

Proposed Response   *Response Status* **O**

Cl **184**   *SC* **184.4.6**   *P***449**   *L***16**   # 100

Huber, Thomas   Nokia

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

Clarify that the circular shift is applied per lane.

SuggestedRemedy

Make similar changes to what was suggested in previous sections - remove the unnecessary variable p and associated for loop in the pseudocode, and add a sentence stating that the circular shift process is performed on each lane individually.

Proposed Response   *Response Status* **O**

Cl **184**   *SC* **184.4.7.1**   *P***450**   *L***12**   # 101

Huber, Thomas   Nokia

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

The DSP frame should probably be a level 3 clause of its own, rather than a sub-clause under BCH interleaver.

SuggestedRemedy

Change to a level 3 heading

Proposed Response   *Response Status* **O**

Cl **184**   *SC* **184.4.7.1**   *P***450**   *L***18**   # 102

Huber, Thomas   Nokia

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

The first sentence of the second paragraph could be written more clearly.

SuggestedRemedy

Replace with "Two streams of DSP frames, one for each polarization, are generated by the inner FEC."

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **102**   Page 21 of 118
5/3/2024 10:09:28 AM

Cl **184**   *SC* **184.4.7.2**   *P* **450**   *L* **45**   # 103

Huber, Thomas   Nokia

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

It is not clear what "192 bits that are complemented with zeros" is intended to mean. Based on what is in Table 184-2, I think the intent is that a zero is inserted after each bit of the PRBS9 ouput to form the bit-pairs that become the PS symbols. Also, the text talks about 4-bit PS symbols, but Table 184-2 is showing bit-pairs for each component rather than 4-bit symbols without explaining that outputs 0 and 1 are for the X polarization (so the X PRBS is spread across outputs 0 and 1) and outputs 2 and 3 are for the Y polarization.

SuggestedRemedy

Revise the two pargraphs above table 184-1 to read as follows:
For both DSP frame_0 and DSP frame_1, the generator is initialized using the seed at the start of every DSP frame. The generator produces a sequence of 192 bits. A zero bit inserted after each bit to generate the bit-pairs that form the pilot symbos, which use the outer points of the 16QAM constellation.

The generator polynomial and seed values are shown in Figure 184-6 and listed in Table 184-1. The complete pilot sequence is shown in Table 184-2. The bit-pairs for the X polarization are distributed in a round-robin manner to outputs 0 and 1. The bit-pairs for the Y polarization are distributed in a round-robin manner to outputs 2 and 3.

Proposed Response   *Response Status*   **O**

Cl **184**   *SC* **184.4.9**   *P* **452**   *L* **50**   # 104

Huber, Thomas   Nokia

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

The editor's note suggesting that the mapping to analog signals probably belongs in the PMD clause seems to make sense, in which case this clause is really not "DP-16QAM mapping", it's really just mapping to 4-level signals, which the PMD will then turn into DP-16QAM.

SuggestedRemedy

Change the title to "4-level signal mapper", and make the corresponding change in 184.5.3.

Proposed Response   *Response Status*   **O**

Cl **184**   *SC* **184.4.9**   *P* **452**   *L* **50**   # 105

Huber, Thomas   Nokia

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

The overall flow would be improved if it went BCH interleaver, 4-level signal mapping, DSP frame, with all the pilot symbol details then in the DSP frame clause.

SuggestedRemedy

Revise so the flow is like this:
184.4.7 BCH interleaver
184.4.8 Four-level signal mapping (current 184.4.9, without subclauses)
184.4.9 DSP frame generation (current 184.4.7.1)
184.4.9.1 Pilot sequence (current 184.4.7.2 and 184.4.9.1)

Proposed Response   *Response Status*   **O**

Cl **184**   *SC* **184.5.1**   *P* **455**   *L* **42**   # 106

Huber, Thomas   Nokia

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

The paragraph that begins with "the signals Rx_Xi, Rx_XQ, …" doesn't seem to make sense. The Tx and Rx signals are not guaranteed to be the same (i.e., Tx_XI can be received as any of the four components), but the contents of Tx_XI aren't distibuted to all the Rx signals.

SuggestedRemedy

Revise to say: The signals Rx_XI, Rx_XQ, Rx_YI, and Rx_YQ each represent one of the corresponding Tx_XI, Tx_XQ, Tx_YI, Tx_YQ signals from the transmitting PMD. The association between Tx and Rx components is arbitary (e.g., Rx_XI can be any of the 4 Tx components).

Proposed Response   *Response Status*   **O**

Cl **184**   *SC* **184.5.8**   *P* **457**   *L* **45**   # 107

Huber, Thomas   Nokia

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

Similar changes should be made in the convolutional de-interleaver as were requested for the convolutional interleaver in earlier comments

SuggestedRemedy

Revise the items in the lettered list and the algoritm to align with whatever changes are agreed for the convolutional interleaver.

Proposed Response   *Response Status*   **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **107**   Page 22 of 118
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Cl **186**   *SC* **186**   *P***491**   *L***1**   # 108

Huber, Thomas   Nokia

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

The baseline for the 800GBASE-ER1[-20] PCS has issues with PTP accuracy when an extender sublayer is used.

SuggestedRemedy

Update the baseline per presentations in the May meeting proposing a mechanism to reduce the PTP inaccuracy.

Proposed Response   *Response Status* **O**

Cl **187**   *SC* **187.5.1**   *P***501**   *L***8**   # 109

Huber, Thomas   Nokia

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

The ppm value for this PMD should be 20 ppm

SuggestedRemedy

Repalce TBD with 20

Proposed Response   *Response Status* **O**

Cl **187**   *SC* **187.5.2**   *P***501**   *L***8**   # 110

Huber, Thomas   Nokia

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

The ppm value for this PMD should be 20 ppm

SuggestedRemedy

Repalce TBD with 20

Proposed Response   *Response Status* **O**

Cl **1**   *SC* **1.4.184da**   *P***49**   *L***44**   # 111

Huber, Thomas   Nokia

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

Since 800GBASE-ER1 and -ER1-20 have a separate PCS, the definition for 800GBASE-ER1 and ER1-20 should refer to 800GBASE-ER1 encoding rather than 800GBASE-R encoding

SuggestedRemedy

Change 800GBASE-R to 800GBASE-ER1 for both the ER1 and ER1-20 definitions.

Proposed Response   *Response Status* **O**

Cl **30**   *SC* **30.3.2.1.2**   *P***53**   *L***11**   # 112

Huber, Thomas   Nokia

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

There should also be an entry for 800GBASE-ER1 since it is a different PCS

SuggestedRemedy

Add a new editing instruction to insert 800GBASE-ER1 after 400GBASE-R.(or before the entry for 800GBASE-R).

Proposed Response   *Response Status* **O**

Cl **182**   *SC* **182.8.5**   *P***411**   *L***30**   # 113

Stassar, Peter   Huawei Technologies

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

Currently reference is made to compliance channel in 121.8.5.2, which is for 500m instead of 2km

SuggestedRemedy

Create new subclause 182.8.5.1 and refer to it instead of 121.8.5.2. Create 182.5.2.1 with contents along the lines of 124.8.5.1 from 802.3df with the same compliance channel. Develop with editorial license

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **113**   Page 23 of 118
5/3/2024 10:09:28 AM

Cl **185** *SC* **185.3** *P* **473** *L* **31** # 114

Stassar, Peter Huawei Technologies

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

The TBDs need to be replaced by values. Follow the same methodology as in 154 and latest draft D3.0 of P802.3cw

SuggestedRemedy

Replace contents by The sum of the transmit and receive delays at one end of the link contributed by the 800GBASE-LR1 PMD including 2 m of fiber in one direction shall be no more than 16 384 bit times (32 pause_quanta or 20.48 ns).
A description of overall system delay constraints and the definitions for bit times and pause_quanta can be found in 169.4 and its references.

Proposed Response *Response Status* **O**

Cl **187** *SC* **187.3** *P* **497** *L* **31** # 115

Stassar, Peter Huawei Technologies

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

The TBDs need to be replaced by values. Follow the same methodology as in 154 and latest draft D3.0 of P802.3cw

SuggestedRemedy

Replace contents by The sum of the transmit and receive delays at one end of the link contributed by the 800GBASE-LR1 PMD including 2 m of fiber in one direction shall be no more than 16 384 bit times (32 pause_quanta or 20.48 ns).
A description of overall system delay constraints and the definitions for bit times and pause_quanta can be found in 169.4 and its references.

Proposed Response *Response Status* **O**

Cl **187** *SC* **187.6** *P* **503** *L* **44** # 116

Stassar, Peter Huawei Technologies

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

Negative dispersion does not occur around 1550 nm. 0 ps/nm is the minimum. Only need min and max dispersion as in draft D3.0 of P802.3cw. A safe upper limit of 20 ps/nm.km can be used for a wavelength close to 1550 nm

SuggestedRemedy

Replace "Positive dispersion (max)" by "Chromatic dispersion (max)" with value 400 ps/nm for ER1-20 and 800 ps/nm for ER1. Replace "Negative dispersion (min)" by "Chromatic dispersion (min)" with value 0 ps/nm for both ER1-20 and for ER1.

Proposed Response *Response Status* **O**

Cl **187** *SC* **187.5** *P* **502** *L* **17** # 117

Stassar, Peter Huawei Technologies

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

Previously for Clause 154 and draft Clause 156 in D3.0 for P802.3cw 20 dB maximum receiver reflectance has been used, which is a common value in the industry and in draft Clause 155.5.2

SuggestedRemedy

For Receiver reflectance (max) replace TBD by 20 dB for both ER1-20 and ER1

Proposed Response *Response Status* **O**

Cl **178** *SC* **178.10.1** *P* **285** *L* **18** # 118

Sakai, Toshiaki Socionext

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

COM reference package parameter vlaue. (transmission line parameter tau)
In "Table 178–12" class A package model Transmission line parameter τ(tau) value is 6.141e-4 ns/mm, but based on the adopted motion#10, Nov/2024, llim_3dj_01a_2311.pdf (page8-9), the value is 6.141e-3. The value should be 6.141e-3 ns/mm.

SuggestedRemedy

Change τ(tau) value in Table 178-12 (class A package) from 6.141e-4 ns/mm to 6.141e-3 ns/mm.
Or simply delete this row, as the τ(tau) value in table 93A-3 is 6.141e-3 ns/mm.

Proposed Response *Response Status* **O**

Cl **178** *SC* **178.10.1** *P* **285** *L* **28** # 119

Sakai, Toshiaki Socionext

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

COM reference package parameter vlaue.
"Table 178–12" class B package model Transmission line parameter τ(tau) value is 6.141e-4 ns/mm, but based on the adopted motion#10, Nov/2024, llim_3dj_01a_2311.pdf (page8-9), the value is 6.141e-3. The value should be 6.141e-3 ns/mm.

SuggestedRemedy

Change τ(tau) value in Table 178-12 (class B package)from 6.141e-4 ns/mm to 6.141e-3 ns/mm.
Or simply delete this row, as the τ(tau) value in table 93A-3 is 6.141e-3 ns/mm.

Proposed Response *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **119**

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Cl **179**   *SC* **179.11.7**   *P* **331**   *L* **18**   # 120

Sakai, Toshiaki   Socionext

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

COM reference package parameter vlaue. (transmission line parameter tau)
In "Table 179–15" class A package model Transmission line parameter τ(tau) value is 6.141e-4 ns/mm, but based on the adopted motion#10, Nov/2024, (llim_3dj_01a_2311.pdf (page8-9), the value is 6.141e-3. The value should be 6.141e-3 ns/mm.

SuggestedRemedy

Change τ(tau) value in Table 179-15 (class A package) from 6.141e-4 ns/mm to 6.141e-3 ns/mm.
 Or simply delete this row, as the τ(tau) value in table 93A-3 is 6.141e-3 ns/mm.

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.11.7**   *P* **331**   *L* **28**   # 121

Sakai, Toshiaki   Socionext

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

COM reference package parameter vlaue. (transmission line parameter tau)
In "Table 179–15" class B package model Transmission line parameter τ(tau) value is 6.141e-4 ns/mm, but based on the adopted motion#10, Nov/2024, (llim_3dj_01a_2311.pdf (page8-9), the value is 6.141e-3. The value should be 6.141e-3 ns/mm.

SuggestedRemedy

Change τ(tau) value in Table 179-15 (class B package) from 6.141e-4 ns/mm to 6.141e-3 ns/mm.
 Or simply delete this row, as the τ(tau) value in table 93A-3 is 6.141e-3 ns/mm.

Proposed Response   *Response Status* **O**

Cl **176D**   *SC* **176D.4.1**   *P* **605**   *L* **16**   # 122

Sakai, Toshiaki   Socionext

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

COM reference package parameter vlaue. (transmission line parameter tau)
In "Table 176D–6" class A package model Transmission line parameter τ(tau) value is 6.141e-4 ns/mm, but based on the adopted motion#10, Nov/2024, llim_3dj_01a_2311.pdf (page8-9), the value is 6.141e-3. The value should be 6.141e-3 ns/mm.

SuggestedRemedy

Change τ(tau) value in Table 176D-6 (class A package) from 6.141e-4 ns/mm to 6.141e-3 ns/mm.
 Or simply delete this row, as the τ(tau) value in table 93A-3 is 6.141e-3 ns/mm.

Proposed Response   *Response Status* **O**

Cl **176D**   *SC* **176D.4.1**   *P* **605**   *L* **26**   # 123

Sakai, Toshiaki   Socionext

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

COM reference package parameter vlaue. (transmission line parameter tau)
In "Table 176D–6" classB package model Transmission line parameter τ(tau) value is 6.141e-4 ns/mm, but based on the adopted motion#10, Nov/2024, llim_3dj_01a_2311.pdf (page8-9), the value is 6.141e-3. The value should be 6.141e-3 ns/mm.

SuggestedRemedy

Change τ(tau) value in Table 176D-6 (class B package) from 6.141e-4 ns/mm to 6.141e-3 ns/mm.
 Or simply delete this row, as the τ(tau) value in table 93A-3 is 6.141e-3 ns/mm.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

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Cl **179**   *SC* **179.9.4**   *P* **309**   *L* **23**   # 124

Sakai, Toshiaki   Socionext

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

Ttransmitter signal measurement filter bandwidth description.
"Unless specified otherwise, transmitter signal measurements are made for each lane separately using a fourth-order Bessel-Thomson low-pass response with 3 dB bandwidth of 40 GHz, with AC-coupled connection from TP2 to the test equipment."
The 4th-BW filter BW should be "TBD GHz", the same as for CL178.9.2, AN176D.3.3 and AN176E.3.3, as the Nyquist frequency of the signal is 53.125GHz and 40GHz is too low..

SuggestedRemedy

Change 40GHz to TBD GHz.

Proposed Response   *Response Status*   **O**

Cl **183**   *SC* **183.7.1**   *P* **431**   *L* **31**   # 125

Johnson, John   Broadcom

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

Clause 183.7.1 is TBD.

SuggestedRemedy

Use the same text and table as given in 182.7.1. Since this sub-clause only reiterates fiber cable specs from external standards, not 802.3 specific specs, this should not be controversial.

Proposed Response   *Response Status*   **O**

Cl **183**   *SC* **183.7.2**   *P* **431**   *L* **41**   # 126

Johnson, John   Broadcom

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

Clause 183.7.2 is TBD.

SuggestedRemedy

Use the same text as given in 182.7.2: "An optical fiber connection, as shown in Figure 183–7, consists of a mated pair of optical connectors." Since this is a basic definition of terms, it should not be controversial.

Proposed Response   *Response Status*   **O**

Cl **180**   *SC* **180.6.3**   *P* **356**   *L* **47**   # 127

Johnson, John   Broadcom

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

The power budget does not explicitly say what the penalty allocation is for MPI and DGD. It's implied by the difference between Allocation for penalties (for max TDECQ) and TDECQ(max). This makes it hard for average readers to understand the power budget.

SuggestedRemedy

Add toTable 180-9, footnote (b), "This value includes an allocation of 0.1 dB for MPI and DGD penalties."

Proposed Response   *Response Status*   **O**

Cl **181**   *SC* **181.6.3**   *P* **381**   *L* **48**   # 128

Johnson, John   Broadcom

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

The power budget does not explicitly say what the penalty allocation is for MPI and DGD. It's implied by the difference between Allocation for penalties (for max TDECQ) and TDECQ(max). This makes it hard for average readers to understand the power budget.

SuggestedRemedy

Add toTable 181-7, footnote (d), "This value includes an allocation of 0.5 dB for MPI and DGD penalties."

Proposed Response   *Response Status*   **O**

Cl **176E**   *SC* **176E.2**   *P* **615**   *L* **23**   # 129

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

Figure depicts loss should be bump-bump

SuggestedRemedy

...application and the associated ILdd bump-bump budget at 53.125 GHz
To make it more clear Host C2M Component should be changed to Host C2M Device and Module C2M Device

Proposed Response   *Response Status*   **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **129**   Page 26 of 118
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Cl **176E**   *SC* **176E.2**   *P* **615**   *L* **33**   # 130

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

Loss budgets are TBD

SuggestedRemedy

See Ghiasi C2M May-24 Contribution for background on the numbers
IIDD=28 dB
Connector with one via = 3 dB
Module IIdd = 3.6 dB
Host IIdd=21.4 dB

Proposed Response   *Response Status* **O**

Cl **176E**   *SC* **176E.3.3**   *P* **617**   *L* **33**   # 131

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

3 dB BW is TBD

SuggestedRemedy

propose to use 0.55*Baudrate=58.4375 GHz but in current OCM code we use Butterworth,
should the COM for C2M be changed to BT4 fitler?

Proposed Response   *Response Status* **O**

Cl **176E**   *SC* **176E.3.3**   *P* **617**   *L* **35**   # 132

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

Eye height and VEC are TBD

SuggestedRemedy

See Ghiasi C2M May-24 Contribution for background on the numbers
VEC=10.7 dB
VEO=8 mV

Proposed Response   *Response Status* **O**

Cl **176E**   *SC* **176E.3.5**   *P* **621**   *L* **7**   # 133

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

BW is TBD

SuggestedRemedy

propose to use 0.55*Baudrate=58.4375 GHz

Proposed Response   *Response Status* **O**

Cl **176E**   *SC* **176E.4.1**   *P* **621**   *L* **6**   # 134

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

Loss is TBD

SuggestedRemedy

See Ghiasi C2M May-24 Contribution for background on the numbers
Bump-bump Insertion loss at Nyquist frequency (53.125 GHz) is less than or equal to 28 dB

Proposed Response   *Response Status* **O**

Cl **176E**   *SC* **176E.5.2**   *P* **633**   *L* **39**   # 135

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

Eye opening reference receiver parameters will be different between TP1d and TP4a
measurement

SuggestedRemedy

Given that number of module plug implementation will have COC or even if there is
package it will be core-less ~8 mm so there is no need to add package after HCB given the
loss of the HCB and plug boards are similar.
At TP4a this is just the output of the module should be tested with synthetic
- short trace
- long trace
recommendation is to measure at the ASIC ball otherwise we would need at least 2 test
cases with Package A and 2 with Package B

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **135**   Page 27 of 118
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Cl **176E**   *SC* **176E.5.2**   *P* **633**   *L* **47**   # 136

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

TP1d and TP4a measurement should be done without device model with just 50 scope termination

SuggestedRemedy

Device model - NA
Single ended transmitter termination - NA
Single ended reference resistance - 50 ohms

Proposed Response   *Response Status*   **O**

Cl **176E**   *SC* **176E.5.2**   *P* **634**   *L* **5**   # 137

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

Single ended receive termination and receive 3 dB BW

SuggestedRemedy

Single ended receive termination is the 50 ohm scope termination
Receive 3 dB BW=0.55*106.25=58.4375 GHz

Proposed Response   *Response Status*   **O**

Cl **176E**   *SC* **176E.5.2**   *P* **634**   *L* **8**   # 138

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

Transmitter equalizer coefficients

SuggestedRemedy

Given little benefit of TX FFE C(-3) - NA
C(0)=0.65
C(-1)= [-0.3:0.02:0]
C(-2)=[0:.02:0.14]
C(1)=[-0.14:.02:0.14] also goes positive to allow slowing driver for reflection mitigation

Proposed Response   *Response Status*   **O**

Cl **176E**   *SC* **176E.5.2**   *P* **634**   *L* **50**   # 139

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

Jitter and noise parameters are TBD

SuggestedRemedy

See Ghiasi C2M May-24 Contribution for background on the numbers
Eta0=1.25E-8
Transmitter SNR = NA for reference receiver but may use 33 dB for COM code
Transmitter Sigma = NA for reference receiver but may use 0.01 UI for COM code
Transmitter dual-Dirac jitter = NA for reference receiver but may use 0.02 UI for COM code
Transmitter RLM = NA for reference receiver but may use 95% for COM code

Proposed Response   *Response Status*   **O**

Cl **176E**   *SC* **176E.5.2**   *P* **635**   *L* **50**   # 140

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

Reference equalizer is TBD

SuggestedRemedy

Propose to use fix 25 tap FFE with 1T DFE
Max # of pre-cursor taps = 6
DFE max tap weight = 0.75

Proposed Response   *Response Status*   **O**

Cl **176D**   *SC* **176D.4.1**   *P* **604**   *L* **50**   # 141

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

Missing TBDs

SuggestedRemedy

Ro= 50 ohms
Rdr=50 ohms
RDt=50 ohms
Receiver 3 dB BW=0.55*106.25=58.4375 GHz

Proposed Response   *Response Status*   **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **141**

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Cl **176D**   *SC* **176D.4.1**   *P* **605**   *L* **10**   # 142

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

Transmitter equalizer coefficients

SuggestedRemedy

Given little benefit of TX FFE C(-3) - NA
C(0)=0.65
C(-1)= [-0.3:0.02:0]
C(-2)=[0:.02:0.14]
C(1)=[-0.14:.02:0.14] also goes positive to allow slowing driver for reflection mitigation

Proposed Response   *Response Status* **O**

Cl **176D**   *SC* **176D.4.1**   *P* **605**   *L* **52**   # 143

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

C2C should be aligned with C2M and addressing TBDs

SuggestedRemedy

SNRTx=33 dB
Add=0.02 UI
Sigma=0.01 UI
RLM=0.95
Eta0=1.25E-8

Proposed Response   *Response Status* **O**

Cl **176D**   *SC* **176D.4.1**   *P* **605**   *L* **52**   # 144

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

C2C reference equalizer should be aligned with C2M and addressing TBDs

SuggestedRemedy

Propose to use fix 25 tap FFE with 1T DFE
Max # of pre-cursor taps = 6
DFE max tap weight = 0.75

Proposed Response   *Response Status* **O**

Cl **181**   *SC* **181.4**   *P* **373**   *L* **33**   # 145

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

Prior to 181.4 add section for PMA function to support precoder to mitigate burst errors

SuggestedRemedy

The transmitter need to supports 1/(1+D) mod 4 precoding, as specified in 135.5.7.2, 120.5.7.2, and 173.5.7.2, 6 and 176.9.1.2, that may be enabled or disabled as needed with OLT, without OLT the optical transmitter should enable 1/(1+D) mod 4 precoding to mitigate burst error.

Proposed Response   *Response Status* **O**

Cl **180**   *SC* **180.4**   *P* **349**   *L* **10**   # 146

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

Prior to 180.4 add section for PMA function to support precoder to mitigate burst errors

SuggestedRemedy

The transmitter need to supports 1/(1+D) mod 4 precoding, as specified in 135.5.7.2, 120.5.7.2, and 173.5.7.2, 6 and 176.9.1.2, that may be enabled or disabled as needed with OLT, without OLT the optical transmitter should enable 1/(1+D) mod 4 precoding to mitigate burst error.

Proposed Response   *Response Status* **O**

Cl **182**   *SC* **182.4**   *P* **397**   *L* **20**   # 147

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

Prior to 182.4 add section for PMA function to support precoder to mitigate burst errors

SuggestedRemedy

The transmitter need to supports 1/(1+D) mod 4 precoding, as specified in 135.5.7.2, 120.5.7.2, and 173.5.7.2, 6 and 176.9.1.2, that may be enabled or disabled as needed with OLT, without OLT the optical transmitter should enable 1/(1+D) mod 4 precoding to mitigate burst error.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **147**

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Cl **183**   *SC* **183.4**   *P***420**   *L***37**   # 148

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

Prior to 183.4 add section for PMA function to support precoder to mitigate burst errors

SuggestedRemedy

The transmitter need to supports 1/(1+D) mod 4 precoding, as specified in 135.5.7.2, 120.5.7.2, and 173.5.7.2, 6 and 176.9.1.2, that may be enabled or disabled as needed with OLT, without OLT the optical transmitter should enable 1/(1+D) mod 4 precoding to mitigate burst error.

Proposed Response   *Response Status*   **O**

Cl **73**   *SC* **73**   *P***85**   *L***9**   # 149

Mi, Guangcan   Huawei Technologies Co., Ltd

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

Table 73-5 is missing the indication of higherst priority.

SuggestedRemedy

change 1.6Tb/s 8lane in the capability column to 1.6Tb/s 8 lane, highest priority.

Proposed Response   *Response Status*   **O**

Cl **116**   *SC* **116**   *P***94**   *L***6**   # 150

Mi, Guangcan   Huawei Technologies Co., Ltd

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

In table 116-3, the last two column, missusage of PMD names.

SuggestedRemedy

change PHY type of CL 178 and 179 in the table to the correct nomenclature, i.e., 200GBASE-KR1 and 200GBASE-CR1

Proposed Response   *Response Status*   **O**

Cl **116**   *SC* **116**   *P***95**   *L***4**   # 151

Mi, Guangcan   Huawei Technologies Co., Ltd

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

In table 116-3a, the last two column, missusage of PMD names.

SuggestedRemedy

change PHY type of CL 178 and 179 in the table to the correct nomenclature, i.e., 400GBASE-KR2 and 400GBASE-CR2

Proposed Response   *Response Status*   **O**

Cl **116**   *SC* **116**   *P***102**   *L***5**   # 152

Mi, Guangcan   Huawei Technologies Co., Ltd

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

200GBASE-R SM PMA delay constraint is missing

SuggestedRemedy

Proposed Response   *Response Status*   **O**

Cl **116**   *SC* **116**   *P***107**   *L***4**   # 153

Mi, Guangcan   Huawei Technologies Co., Ltd

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

In Table 116-9,   there should be no applicable SP1 and SP6 for 113.4375GBd PMD lane

SuggestedRemedy

change the content of row SP1 and SP6 in the column of 113.4375GBd PMD lane to N/A

Proposed Response   *Response Status*   **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **153**

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Cl **169**   *SC* **169**   *P* **116**   *L* **17**   # 154

Mi, Guangcan   Huawei Technologies Co., Ltd

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

In Table 169-1, Row of 800GBASE-CR4 was described as 800Gb/s PHY using 800GBASE-R encoding over four lanes of twinaxial copper cable, which is inconsistent with the description in page 49, 1.4.184aa

SuggestedRemedy

make the language consistent.

Proposed Response   *Response Status* **O**

Cl **169**   *SC* **169**   *P* **116**   *L* **15**   # 155

Mi, Guangcan   Huawei Technologies Co., Ltd

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

same as the previous comment on 800GBASE-CR4

SuggestedRemedy

make the description consistent

Proposed Response   *Response Status* **O**

Cl **169**   *SC* **169**   *P* **118**   *L* **4**   # 156

Mi, Guangcan   Huawei Technologies Co., Ltd

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

In table 169-3, Phy type and clause correlation was marked incorrectly for the columns of 8000GBASE-DR8 PMD and 800GBASE-DR8-2 PMD

SuggestedRemedy

remove the unnecessary M in the following rows for 800GBASE-DR8 PMD: 800GBASe-DR4, 800GBASE-FR4-500. remove the unnecessary M in the following rows for 800GBASE-DR8-2 PMD: 800GBASe-DR4-2, 800GBASE-FR4, and 800GBASE-LR4.

Proposed Response   *Response Status* **O**

Cl **169**   *SC* **169**   *P* **127**   *L* **4**   # 157

Mi, Guangcan   Huawei Technologies Co., Ltd

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

In Table 116-6,   there should be no applicable SP1 and SP6 for 113.4375GBd PMD lane

SuggestedRemedy

change the content of row SP1 and SP6 in the column of 113.4375GBd PMD lane to N/A

Proposed Response   *Response Status* **O**

Cl **169**   *SC* **169**   *P* **123**   *L* **5**   # 158

Mi, Guangcan   Huawei Technologies Co., Ltd

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

In Table 169-4, the delay constraints on 800GBASE-R BM-PMA and 800GBASE-R SM-PMA are missing

SuggestedRemedy

add appropriate rows with TBD if no consensus has been built.

Proposed Response   *Response Status* **O**

Cl **174**   *SC* **174**   *P* **164**   *L* **20**   # 159

Mi, Guangcan   Huawei Technologies Co., Ltd

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

In Table 174-4, the notes for 1.6TBASE-KR8 and 1.6TBASE-CR8 says includes the medium in one direction. No length of the medium was provided, nor any explicit delay due to the medium was provided. While In Table 169-4, a definitive of 14ns allocated for one direction through cable medium was provided for 800GBASE-CR4. One would assume 1.6TBASE-CR8 would be consistent with 800GBASE-CR4. The same problem applies to 1.6TBASE-KR8.

SuggestedRemedy

Put in explicit allocation of delay constraints for the medium used in 1.6T BASE-CR8 and 1.6TBASE-KR8. Align with that of 800GBASE-CR4 and 800GBASE-KR4, if technically feasibly.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

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Cl **180**　　*SC* **180.4.1**　　　　*P* **350**　　　*L* **13**　　　# 160

Yu, Rang-chen　　　　　　　　　　InnoLight

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

A typo of 'L3' in figure 180-2, right side, 3rd channel output label.

SuggestedRemedy

It should be 'L2'.

Proposed Response　　　*Response Status* **O**

Cl **181**　　*SC* **181.6.3**　　　　*P* **381**　　　*L* **36**　　　# 161

Yu, Rang-chen　　　　　　　　　　InnoLight

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

Power budget (for maximum TDECQ)' for 800GBASE-FR4-500 in Table 181-7 could be incorrect. It should be equal to channel IL + allocation for penalties (for maximum TDECQ).

SuggestedRemedy

Power budget (for maximum TDECQ)' in Table 181-7 should be updated to 7.4 dB

Proposed Response　　　*Response Status* **O**

Cl **181**　　*SC* **181.6.1**　　　　*P* **378**　　　*L* **16**　　　# 162

Yu, Rang-chen　　　　　　　　　　InnoLight

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

recommend relationship between 'Tx_OMAout (min)' and 'Tx_Pavg (min)' (in Table 181–5) follow 400G FR4, with delta=3dB, assuming max. OER infinite.

SuggestedRemedy

With 'OMAout (min)'=0.8dBm, then 'Average launch power, each lane (min) ' in Table 181–5 should be changed to -2.2dBm.

Proposed Response　　　*Response Status* **O**

Cl **181**　　*SC* **181.6.2**　　　　*P* **380**　　　*L* **18**　　　# 163

Yu, Rang-chen　　　　　　　　　　InnoLight

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

The delta between 'Tx_Pavg(min)' and 'Rx_Pavg(min)' should equal to 'Channel insertion loss' (3.5dB for FR4-500)

SuggestedRemedy

Rx_Pavg (min)' in Table 181–6 should be -2.2dBm-3.5dB=-5.7dBm

Proposed Response　　　*Response Status* **O**

Cl **183**　　*SC* **183.6.1**　　　　*P* **425**　　　*L* **19**　　　# 164

Yu, Rang-chen　　　　　　　　　　InnoLight

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

recommend relationship between 'Tx_OMAout (min)' and 'Tx_Pavg (min)' (in Table 183–6) follow 400G FR4, with delta=3dB, assuming max. OER infinite.

SuggestedRemedy

With 'OMAout (min)'=0.8dBm, then 'Average launch power, each lane (min) ' in Table 183–6 should be changed to -2.2dBm.

Proposed Response　　　*Response Status* **O**

Cl **183**　　*SC* **183.6.2**　　　　*P* **427**　　　*L* **18**　　　# 165

Yu, Rang-chen　　　　　　　　　　InnoLight

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

The delta between 'Tx_Pavg(min)' and 'Rx_Pavg(min)' should equal to 'Channel insertion loss' (4.0dB for FR4)

SuggestedRemedy

Rx_Pavg (min)' in Table 183–7 should be -2.2dBm-4.0dB=-6.2dBm

Proposed Response　　　*Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected　　RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **165**　　　Page 32 of 118
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Cl **183**   *SC* **183.6.1**   *P***425**   *L***19**   # 166

Yu, Rang-chen   InnoLight

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

Recommended relationship between 'Tx_OMAout (min)' and 'Tx_Pavg (min)' for 800G LR4 (in Table 183–6) should follow 400G LR4-6, with delta equal to 3dB, assuming max . OER infinite.

SuggestedRemedy

With 'OMAout (min)'=1.9dBm, then 'Average launch power, each lane' for 800G LR4 in Table 183–6 should be changed to -1.1dBm.

Proposed Response   *Response Status* **O**

Cl **183**   *SC* **183.6.2**   *P***427**   *L***18**   # 167

Yu, Rang-chen   InnoLight

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

The delta between 'Tx_Pavg(min)' and 'Rx_Pavg(min)' for 800G LR4 should equal to 'Channel insertion loss' (6.3dB for LR4)

SuggestedRemedy

Rx_Pavg (min)' for 800G LR4 in Table 183–7 should be -1.1dBm-6.3dB=-7.4dBm

Proposed Response   *Response Status* **O**

Cl **183**   *SC* **183.6.3**   *P***429**   *L***6**   # 168

Yu, Rang-chen   InnoLight

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

Footnote e did not clarify what's the compisiton of total 5dB allocation for penalties.

SuggestedRemedy

Recommend to add "Allocations to penalties for 800G-LR4 including penalties due to dipersion 3.9dB, DGD 0.7dB and MPI 0.4dB" to footnote e.

Proposed Response   *Response Status* **O**

Cl **181**   *SC* **181.6.3**   *P***381**   *L***48**   # 169

Yu, Rang-chen   InnoLight

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

Footnote d did not clarify what's the compisiton of total 3.9dB allocation for penalties.

SuggestedRemedy

Recommend to add "Allocations to penalties for 800G-FR4-500 including penalties due to dipersion 3.4dB, DGD and MPI 0.5dB" to footnote d.

Proposed Response   *Response Status* **O**

Cl **180**   *SC* **180.6.3**   *P***356**   *L***47**   # 170

Yu, Rang-chen   InnoLight

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

Footnote b did not clarify what's the compisiton of total 3.5dB allocation for penalties.

SuggestedRemedy

Recommend to add "Allocations to penalties for DRx series including penalties due to dipersion 3.4dB, DGD and MPI 0.1dB" to footnote b.

Proposed Response   *Response Status* **O**

Cl **182**   *SC* **182.6.3**   *P***404**   *L***3**   # 171

Yu, Rang-chen   InnoLight

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

Although TDECQmax is still TBD. However, the footnote b should also indicate the allocation for penalties, just leave dispersion section as TBD for future update.

SuggestedRemedy

Recommend to add "Allocations to penalties for DRx-2 series including penalties due to dipersion TBDdB, DGD and MPI 0.4dB" to footnote b.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **171**   Page 33 of 118
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Cl **183**   *SC* **183.6.3**   *P* **429**   *L* **6**   # 172

Yu, Rang-chen   InnoLight

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

Although TDECQmax is still TBD. However, the footnote b should also indicate the allocation for penalties, just leave dispersion section as TBD for future update.

SuggestedRemedy

Recommend to add "Allocations to penalties for 800G-FR4 including penalties due to dipersion TBDdB, DGD and MPI 0.5dB" to footnote e.

Proposed Response   *Response Status* **O**

Cl **181**   *SC* **181.7**   *P* **383**   *L* **16**   # 173

Yu, Rang-chen   InnoLight

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

DGDmax (in Table 181–8) probably used DGDmean=0.8ps, it should be 2.24ps refer to 802.3df DR series.

SuggestedRemedy

Recommend change to 2.24ps

Proposed Response   *Response Status* **O**

Cl **177**   *SC* **177.4.6.1**   *P* **255**   *L* **25**   # 174

Ramesh, Sridhar   Maxlinear Inc

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

"Pad frame sequence" naming does not convey purpose in alignment. Suggest to call this field "Frame Alignment Sequence" instead.

SuggestedRemedy

Pad Frame Alignment Sequence

Proposed Response   *Response Status* **O**

Cl **177**   *SC* **177.6.2.3**   *P* **260**   *L* **3**   # 175

Ramesh, Sridhar   Maxlinear Inc

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

Add a counter for uncorrectable codewords (detected with additional one bit parity)

SuggestedRemedy

uncorr_cw_cnt
Countes the number of inner FEC codewords considered uncorrectable by inner FEC decoder

Proposed Response   *Response Status* **O**

Cl **177**   *SC* **177.6.2.3**   *P* **260**   *L* **3**   # 176

Ramesh, Sridhar   Maxlinear Inc

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

Counters defined here do not seem consistent with those defined in Table 177-4.

SuggestedRemedy

Please make definitions of counters consistent with status variables shown on Table 177-4, page 263

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.9.5.4.2**   *P* **323**   *L* **38**   # 177

Ramesh, Sridhar   Maxlinear Inc

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

Table 179-12: Jitter mask extended below 40Khz and above 40MHz for completeness

SuggestedRemedy

Case A - please amend to <= 0.04, Case F, please amend to >= 40

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Comment ID* **177**   Page 34 of 118
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   5/3/2024 10:09:28 AM
SORT ORDER: Comment ID

Cl **184** *SC* **184.4.1** *P* **445** *L* **12** # 178

Brown, Matt Alphawave Semi

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

The process provided in 184.4.1 "Alignment lock and deskew" merely maps bits on the FEC service interface to vectors; it does not include and RS-FEC symbol alignment. The process in 184.4.2 remaps the vectors such that there is alignment to the RS-FEC symbols and the lanes are properly ordered.

SuggestedRemedy

Either combine the two subclauses and process into one subclause or move the RS-FEC symbol alignment process in 184.4.2 to 184.4.1.

Proposed Response *Response Status* **O**

Cl **184** *SC* **184.4.2** *P* **445** *L* **22** # 179

Brown, Matt Alphawave Semi

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

The lane reorder process is stated as being optional, however, that is not the case. It is not required (or optional) if the lanes are already in order (e.g., connected to a PCS above) and mandatory if the lanes may not be in order (e.g., connected to an 8:32 PMA above), thus it is conditional, rather than optional.

SuggestedRemedy

Change the first 2 sentences in 184.4.2 to "If the sublayer above the Inner FEC does not provide the PCS lanes in order at the service interface, the lane reorder function shall reorder the PCS lanes according to the PCS lane number.".

Proposed Response *Response Status* **O**

Cl **174** *SC* **174.1.2** *P* **155** *L* **47** # 180

Brown, Matt Alphawave Semi

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

This list of interface widths has been traditionally included in "new ethernet rate introduction" clauses since 10 Gb/s Ethernet. It seems unecessary and present and extra burden to amend with each new interface added. The number of lanes is abundantly clear in each clause that defines and interface. The original intent was to point out that the structural detail of the specified interfaces are to be as specified while others that are not are not specified.

SuggestedRemedy

Delete the paragraph and lists from page 155 line 47 to page 156 line 12.

Proposed Response *Response Status* **O**

Cl **176** *SC* **176.11** *P* **243** *L* **31** # 181

Brown, Matt Alphawave Semi

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

A similar subclause has traditionally been included in the PMA subclauses, defining the skew at each instantiated interface from the PMD to the PCS. Until now, there was only one type of PMA for each Ethernet rate. Now we have two types defined in two separate clauses for 200G, 400G, and 800G. A rate-neutral and type-neutral specification is required. This seems beyond a subclause in Clause 176.

SuggestedRemedy

Create a new annex (or perhaps a subclause in 176B) used to defined the skew and skew relationships through the PHY sublayer stack. A presented supporting this will be provided.

Proposed Response *Response Status* **O**

Cl **177** *SC* **177.10** *P* **264** *L* **28** # 182

Brown, Matt Alphawave Semi

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

In order for the Inner FEC in combination with the SM-PMA above to interoperate with the already specified 200GBASE-R, 400GBASE-R, and 800GBASE-R PCS, the total skew introduced by the Inner FEC plus the SM-PMA above should be no higher than the the BM-PMA defined for each rate. Furthermore, the skew should exclude the systematic skew that is added then removed by the 8:1 and 16:2 SM-PMA for 200G/400G.

SuggestedRemedy

Specify the maximum skew for the combination of Inner FEC sublayer and the SM-PMA sublayer above it, excluding the systematic skew added then removed by the SM-PMA. A number needs to be determined.

Proposed Response *Response Status* **O**

Cl **177** *SC* **177.5.3** *P* **257** *L* **29** # 183

Brown, Matt Alphawave Semi

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

177.5.3 lists a few counter to be supported by the inner FEC. The defintion for some of these could be improved. Further, additional counters should be included provides bins of error counts to help estimate quality of the link.

SuggestedRemedy

A contribution with more details will be provided.

Proposed Response *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **183** Page 35 of 118
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Cl **184**   *SC* **184.4**   *P* **445**   *L* **22**   # 184

Brown, Matt   Alphawave Semi

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

The Inner FEC transmit (184.4) and receive (184.5) functions provide a BCH encoder/decoder and other functions to be performed on each PCS lane. Although there is one per PCS lane, these should be called "flows" rather than "lanes" to be consistent with other FEC clauses and to differentiate between "lanes" that go between sublayers.

SuggestedRemedy

When describing the process applied to each PCS lane in each direction, use the word "flow" rather than "lane".

Proposed Response   *Response Status* **O**

Cl **00**   *SC* **0**   *P* **0**   *L* **0**   # 185

Brown, Matt   Alphawave Semi

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

Many state diagrams in this draft as well as in the base standard use the operator "++" to indicate that the variable be incremented by 1. However, this operator is never defined.

SuggestedRemedy

Import Clause 21 and…
Amend 21.5 to include definition of "++.
Delete the following from state diagram conventions in multiple clauses. "The notation used in the state diagrams follows the conventions of 21.5. The notation ++ after a counter or integer variable indicates that its value is to be incremented."

Proposed Response   *Response Status* **O**

Cl **176E**   *SC* **176E.3.3**   *P* **617**   *L* **10**   # 186

Ran, Adee   Cisco

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

Host output characteristics need to be defined with consideration of the variable output settings that can result from training.

This will affect the entire subclause 176E.3.3.

SuggestedRemedy

Define the output characteristics using a methodology similar to that of transmitter specifications in 179.9.4.

Use a table similar to Table 179-7 but with different values due to the higher host channel insertion loss budget for C2M.

A detailed proposal will be provided.

Proposed Response   *Response Status* **O**

Cl **176E**   *SC* **176E.3.4**   *P* **621**   *L* **13**   # 187

Ran, Adee   Cisco

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

Module output characteristics need to be defined with consideration of the variable output settings that can result from training.

This will affect the entire subclause 176E.3.4.

SuggestedRemedy

Define the output characteristics using a methodology similar to that of transmitter specifications in 179.9.4.

Use a table similar to Table 179-7 but with different values due to the lower insertion loss assumed for the module output test.

A detailed proposal will be provided.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **187**

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5/3/2024 10:09:28 AM

Cl **176E**　　*SC* **176E.3.5**　　　　*P* **624**　　*L* **3**　　　# 188

Ran, Adee　　　　　　　　　　　Cisco

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

Host input characteristics need to be defined with consideration of the availability of training.

This will affect the entire subclause 176E.3.5.

SuggestedRemedy

Define the input characteristics using a methodology similar to that of receiver specifications in 179.9.5, with the required changes due to the lack of a cable assembly.

Use a table similar to Table 179-10 but with additional rows for DC common-mode voltage and AC common-mode voltage tolerance.

A detailed proposal will be provided.

Proposed Response　　　*Response Status* **O**

Cl **176E**　　*SC* **176E.3.6**　　　　*P* **628**　　*L* **26**　　　# 189

Ran, Adee　　　　　　　　　　　Cisco

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

Module input characteristics need to be defined with consideration of the availability of training.

This will affect the entire subclause 176E.3.6.

SuggestedRemedy

Define the input characteristics using a methodology similar to that of receiver specifications in 179.9.5, with the required changes due to the lack of a cable assembly and usage of MCB instead of HCB.

Use a table similar to Table 179-10 but with additional rows for DC common-mode voltage tolerance and AC common-mode voltage tolerance.

A detailed proposal will be provided.

Proposed Response　　　*Response Status* **O**

Cl **174A**　　*SC* **174A.3**　　　　*P* **539**　　*L* **25**　　　# 190

Ran, Adee　　　　　　　　　　　Cisco

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

174A.3 "Frame loss ratio for a Physical Layer implementation" is empty.

I assume a "Physical Layer implementation" means the path between the RS and the MDI. It is unclear how frame loss ratio can be defined for this path, because the two interfaces are not equivalent; frames are defined only at the RS, and cannot be identified, checked for errors, or counted on the MDI. Similarly, the signals on the MDI cannot be compared to the data stream on the RS, so no other "error metric" can be defined.

This is in contrast to "RS to RS link" and other subclauses, in which such checking and counting is possible.

This subclause should be deleted.

SuggestedRemedy

Delete 174A.3.

Proposed Response　　　*Response Status* **O**

Cl **174A**　　*SC* **174A.4**　　　　*P* **539**　　*L* **30**　　　# 191

Ran, Adee　　　　　　　　　　　Cisco

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

174A.4 "Frame loss ratio for an xMII Extender" is empty.

Since this annex defines several performance metrics, the titles of specific subclauses should be based on the sub-link in question, while the specific requirement (FLR, BER, etc.) should preferably be in the subclause text.

SuggestedRemedy

A presentation with proposed content is planned.

Proposed Response　　　*Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
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Comment ID **191**

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Cl **174A**　　*SC* **174A.5**　　　　　*P* **539**　　　　*L* **36**　　　　# 192

Ran, Adee　　　　　　　　　　　Cisco

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

174A.5 "Frame loss ratio for PHY" is empty.

Since this annex defines several performance metrics, the titles of specific subclauses should be based on the sub-link in question, while the specific requirement (FLR, BER, etc.) should preferably be in the subclause text.

SuggestedRemedy

A presentation with proposed content is planned.

Proposed Response　　　　*Response Status* **O**

Cl **169**　　*SC* **169.2**　　　　　*P* **119**　　　　*L* **31**　　　　# 193

Ran, Adee　　　　　　　　　　　Cisco

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

A new 800GBASE-ER1 PCS is defined in clause 186. It should be mentioned in the introduction clause, 169.2.3 ("Physical Coding Sublayer (PCS)" in 802.3df) which currently only refers to the 800GBASE-R PCS.

SuggestedRemedy

Bring 169.2.3 into the draft and amend it to include the clause 186 PCS.

Proposed Response　　　　*Response Status* **O**

Cl **73**　　*SC* **73.9.1.1**　　　　　*P* **86**　　　　*L* **26**　　　　# 194

Ran, Adee　　　　　　　　　　　Cisco

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

The existing semantics of the link_status parameter of AN_LINK.indication enables only two values, OK and FAIL. This imposes a need to bring up a link within a specified time (link_fail_inhibit_timer), otherwise AN will restart (per the Arbitration state diagram, Figure 73-11). This can cause numerous problems in a segmented link.

The AN should be tolerant to a link in which one or more of the devices is still in the process of training. This can be achieved by adding a third possible value to link_status, indicating that the negotiated PHY is still training.

SuggestedRemedy

A presentation with proposed content is planned.

Proposed Response　　　　*Response Status* **O**

Cl **116**　　*SC* **116.3.2**　　　　　*P* **99**　　　　*L* **52**　　　　# 195

Ran, Adee　　　　　　　　　　　Cisco

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

segment-by-segment training requires passing the RTS status of each device/sublayer in both directions.
When there is a physical interface with a training protocol, RTS is communicated using the protocol. But when two sublayers are attached, e.g. PMD and PMA, the status has to be communicated through the service interface.

This can be achieved if the inter-sublayer service interface includes both IS_SIGNAL.indication and IS_SIGNAL.request.

The values of the parameter SIGNAL_OK should be extended to allow communicating that a sublayer is in the process of training. A new value IN_PROGRESS would enable that.

Similar changes should be applied in clauses 169 and 174. The mapping of RTS to SIGNAL_OK should be defined in annex 176A.

SuggestedRemedy

A presentation with proposed content is planned.

Proposed Response　　　　*Response Status* **O**

Cl **176A**　　*SC* **176A**　　　　　*P* **548**　　　　*L* **6**　　　　# 196

Ran, Adee　　　　　　　　　　　Cisco

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

The annex title includes "Control function and start-up protocol", while in the subclauses and text there are alternative terms such as "interface control function", "Start-up protocol", and "training" (176A.9).

This mega-function requires nomenclature to describe it. It would be good to have an acronym-friendly name so that it can be included in tables of other clauses (e.g. Table 116-3, Table 179-1).

SuggestedRemedy

A presentation with proposed nomenclature is planned.

Proposed Response　　　　*Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
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Comment ID **196**

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5/3/2024 10:09:28 AM

Cl **176A**　　*SC* **176A.9**　　　　　*P* **560**　　　*L* **19**　　　# 197

Ran, Adee　　　　　　　　　　　Cisco

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

The "Segment by segment training" seems to be an introductory subclause that explains the purpose of the whole thing.

It would help readers if this introduction is placed at the beginning of the annex. The current introduction in 176A.1 seems too brief.

SuggestedRemedy

Move 176A.9 and its subclauses into 176A.1 (with some hierarchy) or after it.

Rephrase the text as necessary to make it a good introduction to the control function (e.g., explain what "RTS" stands for).

Proposed Response　　　　*Response Status* **O**

Cl **176A**　　*SC* **176A.2**　　　　　*P* **548**　　　*L* **24**　　　# 198

Ran, Adee　　　　　　　　　　　Cisco

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

"tx_symbol and rx_symbol variables" do not appear in this annex. They are in fact parameters of the service interface primitives of the sublayer that implements the control function.

SuggestedRemedy

Tie the text defining the symbols to the service interface of the sublayer.

Proposed Response　　　　*Response Status* **O**

Cl **176A**　　*SC* **176A.2.3.2**　　　*P* **552**　　　*L* **14**　　　# 199

Ran, Adee　　　　　　　　　　　Cisco

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

"The default identifier for each lane is its lane number (e.g., the default value for identifier_0 is 0 which selects polynomial_0)"

Some interfaces have 8 lanes.

The default mapping provided in Table 176A–1 can be used instead.

SuggestedRemedy

Change to "The default identifier for each lane is the same as that of the PRBS13 function, as shown in Table 176A-1".

Proposed Response　　　　*Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general　　　　*Comment ID* **199**　　Page 39 of 118
COMMENT STATUS: D/dispatched A/accepted R/rejected　　RESPONSE STATUS: O/open W/written C/closed Z/withdrawn　　　　5/3/2024 10:09:28 AM
SORT ORDER: Comment ID

Cl **176A**   *SC* **176A.2.3.3**   *P* **552**   *L* **40**   # 200

Ran, Adee   Cisco

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

"These three variations are produced as described for the PRBS13 free-running function in 176A.2.3.2"

PRBS13 free-running is defined only with PAM4 and does not have PAM2 or PAM4+precoding variants. These variants are defined for the PRBS13 function in 176A.2.3.1, but the definition of the precoding variant includes resetting of the precoder state at the beginning of each training frame, which would be inadequate.

SuggestedRemedy

Change to the following:

The initial state of the PRBS31 generator shall not be all zeros. It may be any other value.

When the training pattern selector is set to PAM4, the training pattern is generated in a similar manner to the definition in 176A.2.3.2, except that PRBS31 generator output is used instead of PRBS13 generator output.

When the training pattern selector is set to PAM2, the training pattern is generated in a similar manner to the definition in 176A.2.3.2, except that PRBS31 generator output is used instead of PRBS13 generator output, and the pair of bits {A, A} is used instead of {A, B}.

When the training pattern selector is set to PAM4 with precoding, the training pattern is generated from the PRBS31 PAM4 pattern by precoding the Gray-mapped PAM4 symbols as specified in 135.5.7.2. The precoder initial state is not specified. The state is not re-initialized or reset during generation of the training pattern.

Proposed Response   *Response Status* **O**

Cl **176A**   *SC* **176A.6**   *P* **557**   *L* **3**   # 201

Ran, Adee   Cisco

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

"When the interface control state diagram (Figure 176A–6) is in the TRAIN_LOCAL state, the device may request its link partner to..."

It is important to also note at which states requests from the link partner should be processed, and what happens in the other states - this may not be obvious.

SuggestedRemedy

Insert the following paragraphs after the first one:

When the interface control state diagram is in either the TRAIN_LOCAL or TRAIN_REMOTE state, the device shall respond to requests received from the link partner.

When the interface control state diagram is in any state other than TRAIN_LOCAL or TRAIN_REMOTE, the device shall not send any requests to the link partner and shall ignore requests from the link partner.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Comment ID* **201**   Page 40 of 118
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   5/3/2024 10:09:28 AM
SORT ORDER: Comment ID

Cl **176A**   *SC* **176A.8**   *P* **559**   *L* **45**   # 202

Ran, Adee   Cisco

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

"When the receiver frame lock bit in the status field of transmitted training frames is set to 1, the time from the receipt of a new request to the acknowledgment of that request shall be less than 2 ms"

This requirement was defined in 802.3cd when training was limited in time (to 3 seconds) in order to prevent limiting the number of change requests due to delayed responses.

The new training scheme is not limited in time, and a receiver can use as many requests as it needs.

In some multi-tasking implementations, a hard 2 ms maximum may be challenging to meet. To avoid real-time requirements, it would be sufficient to have 2 ms as the average response time (and it does not need to be normative). The maximum response time can be relaxed without impact to the protocol.

SuggestedRemedy

Change to
"When the receiver frame lock bit in the status field of transmitted training frames is set to 1, the time from the receipt of a new request to the acknowledgment of that request shall be less than 20 ms. It is recommended that the average response time is less than 2 ms".

Proposed Response   *Response Status*   **O**

Cl **176E**   *SC* **176E.5**   *P* **633**   *L* **12**   # 203

Ran, Adee   Cisco

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

Measurement methodology for C2M should consider the variable output settings that can result from training. Eye opening parameters with specific transmitter settings are not the relevant metrics for transmitter quality anymore.

The measurement methodology of CR transmitter, which focuses on training-related equalizer parameters and training-independent signal parameters, is more suitable.

SuggestedRemedy

Move the measurement methodology section into another annex that both Clause 179 and Annex 176E can refer to.

A detailed proposal will be provided.

Proposed Response   *Response Status*   **O**

Cl **179**   *SC* **179.9.4.7**   *P* **310**   *L* **25**   # 204

Ran, Adee   Cisco

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

Jitter specification is TBD.

Based on https://www.ieee802.org/3/dj/public/adhoc/electrical/24_0104/calvin_3dj_elec_01a_240104. pdf, the jitter measurement methodology of existing clauses 162, 163, and 120G (specifically using the two edges R03/F30) is feasible for measurements with a loss 30 dB. It is expected that the same method can be used for higher losses as long as the scope can maintain CDR lock.

This methodology should be used for all electrical interfaces, with adequate adjustments.

SuggestedRemedy

A detailed proposal will be provided.

Proposed Response   *Response Status*   **O**

Cl **174A**   *SC* **174A.1**   *P* **539**   *L* **10**   # 205

Ran, Adee   Cisco

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

The first subclause of Annex 174 is currently a mini "table of contents" of the clause. This isn't required.

Instead, an introduction to the annex would be helpful for readers. It should provide the relationship between bit error ratio as defined in the project's objective and the frame loss ratio, as well as the purpose of defining error requirements for internal interfaces within the physical layer.

SuggestedRemedy

A presentation with proposed content is planned.

Proposed Response   *Response Status*   **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Comment ID* **205**   Page 41 of 118
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   5/3/2024 10:09:28 AM
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Cl **174A**   *SC* **174A.2**   *P* **539**   *L* **19**   # 206

Ran, Adee   Cisco

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

174A.2 "Frame loss ratio for RS to RS link" is empty.

Since this annex defines several performance metrics, the titles of specific subclauses should be based on the sub-link in question, while the specific requirement (FLR, BER, etc.) should preferably be in the subclause text.

SuggestedRemedy

A presentation with proposed content is planned.

Proposed Response   *Response Status* **O**

Cl **181**   *SC* **181.8.5.1**   *P* **387**   *L* **19**   # 207

Parsons, Earl   CommScope

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

The maximum and minimum dispersion values in this table should be replaced by equations similar to ones found in previous clauses (i.e. Table 151-12). This method is sometimes called "CM1".

SuggestedRemedy

In the minimum column replace "-2.94" with "$0.0115 \times \lambda \times [1-(1324/\lambda)^4]$". In the maximum column replace "1.66" with "$0.0115 \times \lambda \times [1-(1300/\lambda)^4]$". These are the same values as in Table 151-12 with the coefficient divided by 4.

Proposed Response   *Response Status* **O**

Cl **183**   *SC* **183.7**   *P* **431**   *L* **12**   # 208

Parsons, Earl   CommScope

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

The positive and negative dispersion values in this table should come from a channel model that uses a statistical approach. A contribution on fiber disperison statistics will be submitted.

SuggestedRemedy

Replace TBDs with values agreed upon by the Task Force.

Proposed Response   *Response Status* **O**

Cl **178A**   *SC* **178A.1.8**   *P* **654**   *L* **42**   # 209

Shakiba, Hossein   Huawei Technologies Canada

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

Reference to the wrong section 178A.1.6.4

SuggestedRemedy

Change reference to section 178A.1.8.1

Proposed Response   *Response Status* **O**

Cl **178A**   *SC* **178A.1.9**   *P* **657**   *L* **51**   # 210

Shakiba, Hossein   Huawei Technologies Canada

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

h_ISI in equation (178A-29) should not include the main cursor ($h\_ISI(main) = 0$)

SuggestedRemedy

Add a case to define $h\_ISI(n) = 0$ for $n = d+1$

Proposed Response   *Response Status* **O**

Cl **178A**   *SC* **178A.1.11.1**   *P* **660**   *L* **27**   # 211

Shakiba, Hossein   Huawei Technologies Canada

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

The factor 2/3 in equation (178A-36) is specific to PAM4. This change does not apply if the equation is rewritten.
See contributions lim_3dj_02_2405.pdf and shakiba_3dj_01_2405.pdf.

SuggestedRemedy

Change 2/3 to $L/2(L-1)$ to make it general. Note that L=4 still yields 2/3. Please refer to contribution tbd.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **211**   Page 42 of 118
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Cl **178A**   *SC* **178A.1.11.1**   *P* **660**   *L* **33**   # 212

Shakiba, Hossein   Huawei Technologies Canada

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

The factor 3/4 in equation (178A-37), as is or rewritten, is specific to PAM4.
See contributions lim_3dj_02_2405.pdf and shakiba_3dj_01_2405.pdf.

SuggestedRemedy

Change 3/4 to (L-1)/L to make it general. Note that L=4 still yields 3/4.Please refer to contribution tbd.

Proposed Response   *Response Status*   **O**

Cl **178A**   *SC* **178A.1.11.1**   *P* **660**   *L* **52**   # 213

Shakiba, Hossein   Huawei Technologies Canada

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

Although clear, the result of the PDF convolution conv[p(y),p(y/b1)] is a PDF and assumed to have been normalized to satisfy the PDF sum requirement.

SuggestedRemedy

Either mention that after convolution, the result should be normalized, or add a normalization coefficient of 1/b1 in font of conv.

Proposed Response   *Response Status*   **O**

Cl **178A**   *SC* **178A.1.11.1**   *P* **661**   *L* **1**   # 214

Shakiba, Hossein   Huawei Technologies Canada

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

Although clear, the result of the PDF convolution of equation (178A-39) is a PDF and assumed to have been normalized to satisfy the PDF sum requirement.

SuggestedRemedy

Either mention that after convolution, the result should be normalized, or add a normalization coefficient of 1/(1-b1) in font of conv.

Proposed Response   *Response Status*   **O**

Cl **179A**   *SC* **179A.7**   *P* **668**   *L* **9**   # 215

Noujeim, Leesa   Google

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

TP0 and TP5 are not the appropriate test points for Annex 179A COM

SuggestedRemedy

Change text to ".. between TP0d and TP5d"

Proposed Response   *Response Status*   **O**

Cl **179**   *SC* **179.11.1**   *P* **326**   *L* **27**   # 216

Noujeim, Leesa   Google

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

There is no test method or definition for the nominal characteristic impedance of the cable assembly. The components (eg paddle card, twinax) within a cable assembly may have different nominal characteristic impedances. There is no need to specify the nominal characteristic impedance of the cable assembly, since the performance of the cable assembly is determined by cl 179.11.2-7.

SuggestedRemedy

Remove "The nominal characteristic impedance of the cable assembly is 100 ohms"

Proposed Response   *Response Status*   **O**

Cl **179**   *SC* **179.11.2**   *P* **326**   *L* **42**   # 217

Noujeim, Leesa   Google

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

The maximum frequency of 40GHz is is insufficient for 200Gbps/lane PAM4

SuggestedRemedy

Increase to 65GHz, consistent with test equipment capabilities and demonstrated channel rolloff eg in https://www.ieee802.org/3/dj/public/23_11/weaver_3dj_01_2311.pdf and https://www.ieee802.org/3/dj/public/24_01/benartsi_3dj_01_2401.pdf   OR change to TBD

Proposed Response   *Response Status*   **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Comment ID* **217**   Page 43 of 118
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   5/3/2024 10:09:28 AM
SORT ORDER: Comment ID

Cl **179**　　*SC* **179.11.3**　　　　*P* **327**　　　*L* **31**　　　# 218

Noujeim, Leesa　　　　　　　　　Google

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

Practical test fixtures may have discontinuities close to 0.2ns from the host-facing connection (mating interface). If the intent is to remove the test fixture discontinuities from the ERL calculations, we should adjust the 0.2ns

SuggestedRemedy

Change text to "...Tfx equal to twice the delay between the test fixture connector and the test fixture host -facing connection minus 0.2ns or as needed to remove test-fixture discontinuities from the ERL result"

Proposed Response　　　*Response Status* **O**

Cl **179**　　*SC* **179.9.5.5**　　　*P* **324**　　　*L* **5**　　　# 219

Noujeim, Leesa　　　　　　　　　Google

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

Practical test fixtures may have discontinuities close to 0.2ns from the host-facing connection (mating interface). If the intent is to remove the test fixture discontinuities from the ERL calculations, we should adjust the 0.2ns

SuggestedRemedy

Change text to "...Tfx equal to twice the delay between the test fixture connector and the test fixture host -facing connection minus 0.2ns or as needed to remove test-fixture discontinuities from the ERL result"

Proposed Response　　　*Response Status* **O**

Cl **176E**　　*SC* **176E.3.3.3**　　*P* **620**　　　*L* **32**　　　# 220

Noujeim, Leesa　　　　　　　　　Google

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

Practical test fixtures may have discontinuities close to 0.2ns from the host-facing connection (mating interface). If the intent is to remove the test fixture discontinuities from the ERL calculations, we should adjust the 0.2ns

SuggestedRemedy

Change text to "...Tfx equal to twice the delay between the test fixture connector and the test fixture host -facing connection minus 0.2ns or as needed to remove test-fixture discontinuities from the ERL result"

Proposed Response　　　*Response Status* **O**

Cl **176E**　　*SC* **176E.3.4.2**　　*P* **622**　　　*L* **49**　　　# 221

Noujeim, Leesa　　　　　　　　　Google

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

Practical test fixtures may have discontinuities close to 0.2ns from the host-facing connection (mating interface). If the intent is to remove the test fixture discontinuities from the ERL calculations, we should adjust the 0.2ns

SuggestedRemedy

Change text to "...Tfx equal to twice the delay between the test fixture connector and the test fixture host -facing connection minus 0.2ns or as needed to remove test-fixture discontinuities from the ERL result"

Proposed Response　　　*Response Status* **O**

Cl **179B**　　*SC* **179B.1**　　　*P* **669**　　　*L* **15**　　　# 222

Noujeim, Leesa　　　　　　　　　Google

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

Incorrect Annex reference 120G

SuggestedRemedy

Replace 120G with 176E

Proposed Response　　　*Response Status* **O**

Cl **179B**　　*SC* **179B.1**　　　*P* **669**　　　*L* **17**　　　# 223

Noujeim, Leesa　　　　　　　　　Google

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

Missing reference to Module compliance at TP1 and TP4

SuggestedRemedy

Add "Module measurements for Modules specified in Annex 176E are made at TP1 and TP4 with test fixtures as specified in 179B.3. "

Proposed Response　　　*Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected　　　RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **223**

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Cl **179B**   *SC* **179B.4.6**   *P* **676**   *L* **26**   # 224

Noujeim, Leesa   Google

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

SFPxxx is unclear

SuggestedRemedy

Replace "The SFPxxx mated test fixture" with "The single-lane mated test fixture"

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.9.4**   *P* **309**   *L* **23**   # 225

Noujeim, Leesa   Google

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

Adopted baseline https://www.ieee802.org/3/dj/public/24_01/ran_3dj_01a_2401.pdf has BT filter bandwidth as TBD but D1.0 has 40GHz. 3dB bandwidth of 40GHz is insufficient for 200Gbps/lane PAM4

SuggestedRemedy

Increase to 65GHz, consistent with test equipment capabilities and demonstrated channel rolloff eg in https://www.ieee802.org/3/dj/public/23_11/weaver_3dj_01_2311.pdf and https://www.ieee802.org/3/dj/public/24_01/benartsi_3dj_01_2401.pdf   OR change to TBD

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.9.4.3**   *P* **314**   *L* **39**   # 226

Noujeim, Leesa   Google

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

Nb of 6 should be increased since hosts shouldn't be penalized for having reflections within capability of receiver to compensate; hosts in this generation should have equalization capability well beyond 6 UI.

SuggestedRemedy

increase Nb to 20 (or TBD based on ref receiver capabilities)

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.9.4.8**   *P* **315**   *L* **35**   # 227

Noujeim, Leesa   Google

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

Practical test fixtures may have discontinuities close to 0.2ns from the host-facing connection (mating interface). If the intent is to remove the test fixture discontinuities from the ERL calculations, we should adjust the 0.2ns

SuggestedRemedy

Change text to "...Tfx equal to twice the delay between the test fixture connector and the test fixture host -facing connection minus 0.2ns or as needed to remove test-fixture discontinuities from the ERL result"

Proposed Response   *Response Status* **O**

Cl **178A**   *SC* **178A.1.5**   *P* **650**   *L* **7**   # 228

Noujeim, Leesa   Google

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

The port labels on Figure 178A-6 are inconsistent with the cascade order implied in 178A-12 and with the text on line 1.

SuggestedRemedy

In Fig 178A-6 replace "Port 2" with "Port 1" and replace "Port 1" with "Port 2" Alternatively, replace Figure 178A-6 with a copy of Figure 178A-2 and reverse the arrow directions and swap Port 1 with Port 2.

Proposed Response   *Response Status* **O**

Cl **179A**   *SC* **179A.5**   *P* **665**   *L* **24**   # 229

Noujeim, Leesa   Google

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

Doubling ILdd_(host+TFmax) implies both ends of the link have the same host designations.

SuggestedRemedy

Replace "2*ILdd_(host+TFmax)" with "ILdd_(host+tFmax)_end1 + ILdd_(host+tFmax)_end2" or similar notation to accommodate asymmetric Link Configurations in Table 179A-3.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **229**   Page 45 of 118
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Cl **178**   *SC* **178.9.2**   *P* **275**   *L* **48**   # 230

Li, Mike   Intel

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

3dB BW is TBD

SuggestedRemedy

Change it to 65 GHz.
Rational, considering the common and cost effective 1.85mm connector BW, and associated ~7% measurement error, give rise to this number.

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.9.2**   *P* **276**   *L* **19**   # 231

Li, Mike   Intel

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

dERL (min) is TBD

SuggestedRemedy

Change it to -3 dB. See lim_3dj_01_2403a.

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.9.2**   *P* **276**   *L* **20**   # 232

Li, Mike   Intel

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

RLcc (min) is TBD

SuggestedRemedy

Change it to 3.25 dB. See lim_3dj_01_2403a.

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.9.2**   *P* **276**   *L* **28**   # 233

Li, Mike   Intel

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

"absolute value of step size for all taps (max)" ingreated from 802.3ck, value not suitable for 802.3dj at 200G/L, and no simod supports"

SuggestedRemedy

Change it 0.02, see See lim_3dj_01_2405

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.9.2**   *P* **276**   *L* **29**   # 234

Li, Mike   Intel

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

"value at minimum state for c(–3) (max) " from 802.3ck, parameter not suitable for 802.3dj at 200G/L, and no simod supports"

SuggestedRemedy

C(-3) is not needed, delete it, see lim_3dj_01_2405

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.9.2**   *P* **276**   *L* **30**   # 235

Li, Mike   Intel

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

"value at max state for c(–2) (min) " from 802.3ck, parameter not suitable for 802.3dj at 200G/L, and no simod supports"

SuggestedRemedy

change it to 0.16, see lim_3dj_01_2405

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **235**

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Cl **178**   *SC* **178.9.2**   *P* **276**   *L* **38**   # 236

Li, Mike   Intel

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

Output jitter (max) TBD

SuggestedRemedy

reapcle TBDs with:
Jrms : 0.023 UI
J2.7u03: 0.102 UI
J2.7u: 0.110 UI
Even--odd jitter, pk-pk: 0.025 UI
See lim_3dj_01_2403a, lim_3dj_01_2405, and [1], [2], [3]

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.9.2.2**   *P* **278**   *L* **26**   # 237

Li, Mike   Intel

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

Tr is TBD

SuggestedRemedy

repalce it with 0.005 ns, see lim_3dj_01_2403a

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.9.2.2**   *P* **278**   *L* **27**   # 238

Li, Mike   Intel

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

Betax is TBD

SuggestedRemedy

repalce it with 0 GHz, see lim_3dj_01_2403a

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.9.2.2**   *P* **278**   *L* **29**   # 239

Li, Mike   Intel

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

Rox is TBD

SuggestedRemedy

repalce it with 0.618, see lim_3dj_01_2403a

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.9.2.2**   *P* **278**   *L* **31**   # 240

Li, Mike   Intel

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

N is TBD

SuggestedRemedy

repalce it with 400, see lim_3dj_01_2403a

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.9.2.2**   *P* **278**   *L* **32**   # 241

Li, Mike   Intel

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

Nbx is TBD

SuggestedRemedy

repalce it with 44, see lim_3dj_01_2403a, lim_3dj_01_2405

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.9.2.3**   *P* **278**   *L* **46**   # 242

Li, Mike   Intel

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

mac freq is TBD

SuggestedRemedy

repalce it with 80 GHz, see lim_3dj_01_2403a

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **242**

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Cl **178** *SC* **178.9.2.4** *P* **278** *L* **4** # 243

Li, Mike Intel

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

Nv is TBD

SuggestedRemedy

repalce it with 400, seelim_3dj_01_2403a

Proposed Response *Response Status* **O**

Cl **178** *SC* **178.9.3** *P* **280** *L* **9** # 244

Li, Mike Intel

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

dERL is TBD

SuggestedRemedy

repalce it with -3dB, see lim_3dj_01_2403a

Proposed Response *Response Status* **O**

Cl **178** *SC* **178.9.3.3** *P* **280** *L* **40** # 245

Li, Mike Intel

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

3dB BW is TBD

SuggestedRemedy

Change it to 65 GHz.
Rational, considering the common and cost effective 1.85mm connector BW, and associated ~7% measurement error, give rise to this number

Proposed Response *Response Status* **O**

Cl **178** *SC* **178.9.3.3** *P* **282** *L* **12** # 246

Li, Mike Intel

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

FEC symbol error ratio is not aligned with DER value

SuggestedRemedy

change it to 2e-3

Proposed Response *Response Status* **O**

Cl **178** *SC* **178.9.3.3** *P* **282** *L* **13** # 247

Li, Mike Intel

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

IL for Class A PKG are TBDs

SuggestedRemedy

For Test1, reaplce them with IL(min): 13.5dB, Ilmax: 14.5 dB; for Test2, reaplce them with IL(min): 27.5dB, Ilmax: 28.5; see li_3dj_01_2311, lusted_3dj_02_2311.pdf

Proposed Response *Response Status* **O**

Cl **178** *SC* **178.9.3.3** *P* **282** *L* **15** # 248

Li, Mike Intel

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

IL for Class B PKG are TBDs

SuggestedRemedy

For Test1, reaplce them with IL(min): 10.5dB, Ilmax: 11.5 dB; for Test2, reaplce them with IL(min): 21.5dB, Ilmax: 22.5; see li_3dj_01_2311, lusted_3dj_02_2311.pdf

Proposed Response *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **248** Page 48 of 118
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Cl **178**   *SC* **178.9.3.3**   *P* **282**   *L* **16**   # 249

Li, Mike   Intel

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

   COM for test1 and test2 are TBDs

SuggestedRemedy

   Repalced both with 3 dB, see lim_3dj_01_2405

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.10**   *P* **284**   *L* **11**   # 250

Li, Mike   Intel

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

   COM(min) is TBD

SuggestedRemedy

   Repalced both with 3 dB, see lim_3dj_01_2405

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.10**   *P* **284**   *L* **12**   # 251

Li, Mike   Intel

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

   IL(max) is TBD

SuggestedRemedy

   Repalced the TBD with:
   28 dB, Class A PKG pairs with Class A PKG
   25 dB, Class A PKG pairs with Class B PKG
   22 dB, Class B PKG pairs with Class B PKG

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.10**   *P* **284**   *L* **14**   # 252

Li, Mike   Intel

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

   Channel ERL TBD

SuggestedRemedy

   Repalced it with 11 dB, see oif2023.531.00

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.10.1**   *P* **284**   *L* **28**   # 253

Li, Mike   Intel

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

   COM TBD

SuggestedRemedy

   Repalced it with 3 dB, see lim_3dj_01_2405

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.10.1**   *P* **285**   *L* **38**   # 254

Li, Mike   Intel

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

   Ro TBD

SuggestedRemedy

   Repalced it w 50 ohm, see see lim_3dj_01_2405, slide 5

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.10.1**   *P* **285**   *L* **40**   # 255

Li, Mike   Intel

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

   RD(T) TBD

SuggestedRemedy

   Repalced it w 46.25 ohm, see see lim_3dj_01_2405, slide 5

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID   *Comment ID* **255**   Page 49 of 118
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Cl **178** *SC* **178.10.1** *P* **285** *L* **41** # 256

Li, Mike Intel

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

RD(R) TBD

SuggestedRemedy

Repalced it w 46.25 ohm, see see lim_3dj_01_2405, slide 5

Proposed Response *Response Status* **O**

Cl **178** *SC* **178.10.1** *P* **286** *L* **12** # 257

Li, Mike Intel

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

fr TBD

SuggestedRemedy

Repalced it w 0.5, see see lim_3dj_01_2405, slide 5

Proposed Response *Response Status* **O**

Cl **178** *SC* **178.10.1** *P* **286** *L* **14** # 258

Li, Mike Intel

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

C(-3) not needed

SuggestedRemedy

Delete it, see see lim_3dj_01_2405, slide 5

Proposed Response *Response Status* **O**

Cl **178** *SC* **178.10.1** *P* **286** *L* **18** # 259

Li, Mike Intel

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

C(-2) TBD

SuggestedRemedy

Replace it w
0:0.16:0.02(min,max, step),
see see lim_3dj_01_2405, slide 5

Proposed Response *Response Status* **O**

Cl **178** *SC* **178.10.1** *P* **286** *L* **22** # 260

Li, Mike Intel

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

C(-1) TBD

SuggestedRemedy

Replace it w
-0.4.0.0.02 (min,max, step),
see see lim_3dj_01_2405, slide 5

Proposed Response *Response Status* **O**

Cl **178** *SC* **178.10.1** *P* **286** *L* **26** # 261

Li, Mike Intel

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

C(0) TBD

SuggestedRemedy

Replace it w 0.54,
see see lim_3dj_01_2405, slide 5.

Proposed Response *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **261**

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Cl **178**　　*SC* **178.10.1**　　　　*P* **286**　　　　*L* **26**　　　# 262

Li, Mike　　　　　　　　　　Intel

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

C(1) TBD

SuggestedRemedy

Replace it w
-0.2.0.0.02 (min,max, step),
see see lim_3dj_01_2405, slide 5

Proposed Response　　　*Response Status* **O**

Cl **178**　　*SC* **178.10.1**　　　　*P* **286**　　　　*L* **32**　　　# 263

Li, Mike　　　　　　　　　　Intel

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

g1 inherited from 802.3ck, no simod support, not approproaite

SuggestedRemedy

Replace them w
-15 :0, 1 (min, max, step)
see lim_3dj_01_2405, slide 5

Proposed Response　　　*Response Status* **O**

Cl **178**　　*SC* **178.10.1**　　　　*P* **286**　　　　*L* **32**　　　# 264

Li, Mike　　　　　　　　　　Intel

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

g2 inherited from 802.3ck, no simod support, not approproaite

SuggestedRemedy

Replace them w
-5 :0, 1 (min, max, step)
see lim_3dj_01_2405, slide 5

Proposed Response　　　*Response Status* **O**

Cl **178**　　*SC* **178.10.1**　　　　*P* **286**　　　　*L* **40**　　　# 265

Li, Mike　　　　　　　　　　Intel

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

fz1,fz2 from 802.3ck, no simod support, not approproaite

SuggestedRemedy

Replace them w
fb/4.223, fb/80 (fz1,fz2)
see lim_3dj_01_2405, slide 5

Proposed Response　　　*Response Status* **O**

Cl **178**　　*SC* **178.10.1**　　　　*P* **286**　　　　*L* **42**　　　# 266

Li, Mike　　　　　　　　　　Intel

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

f1,fp2, fp3 from 802.3ck, no simod support, not approproaite

SuggestedRemedy

Replace them w
fb/1.8973, fb/2.6562, fb/80 (fp1,fp2, fp3)
see lim_3dj_01_2405, slide 5

Proposed Response　　　*Response Status* **O**

Cl **178**　　*SC* **178.10.1**　　　　*P* **286**　　　　*L* **46**　　　# 267

Li, Mike　　　　　　　　　　Intel

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

Av, Afe, Ane TBDs

SuggestedRemedy

Replace them w
0.413, 0.413, 0.608 V (Av, Afe, Ane)
see lim_3dj_01_2405, slide 5

Proposed Response　　　*Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected　　RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **267**　　　Page 51 of 118
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Cl **178**　　*SC* **178.10.1**　　　　*P* **286**　　　*L* **50**　　　# 268

Li, Mike　　　　　　　　　　　Intel

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

Tr TBD

SuggestedRemedy

Replace it w 0.004 ns
see lim_3dj_01_2405, slide 5

Proposed Response　　　*Response Status* **O**

Cl **178**　　*SC* **178.10.1**　　　　*P* **286**　　　*L* **53**　　　# 269

Li, Mike　　　　　　　　　　　Intel

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

eta0

SuggestedRemedy

Replace it w 5e-9 V^2/GHz
see lim_3dj_01_2405, slide 5

Proposed Response　　　*Response Status* **O**

Cl **178**　　*SC* **178.10.1**　　　　*P* **287**　　　*L* **5**　　　# 270

Li, Mike　　　　　　　　　　　Intel

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

SNRTX TBD

SuggestedRemedy

Replace it w 33 dB
see lim_3dj_01_2405, slide 5

Proposed Response　　　*Response Status* **O**

Cl **178**　　*SC* **178.10.1**　　　　*P* **287**　　　*L* **7**　　　# 271

Li, Mike　　　　　　　　　　　Intel

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

sigmaRJ TBD

SuggestedRemedy

Replace it w 0.01 UI,
see lim_3dj_01_2405, slide 5

Proposed Response　　　*Response Status* **O**

Cl **178**　　*SC* **178.10.1**　　　　*P* **287**　　　*L* **8**　　　# 272

Li, Mike　　　　　　　　　　　Intel

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

ADD TBD

SuggestedRemedy

Replace it w 0.02 UI,
see lim_3dj_01_2405, slide 5

Proposed Response　　　*Response Status* **O**

Cl **178**　　*SC* **178.10.1**　　　　*P* **287**　　　*L* **9**　　　# 273

Li, Mike　　　　　　　　　　　Intel

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

RLM TBD

SuggestedRemedy

Replace it w 0.95,
see lim_3dj_01_2405, slide 5

Proposed Response　　　*Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected　　RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **273**　　　Page 52 of 118
5/3/2024 10:09:28 AM

Cl **178** *SC* **178.10.1** *P* **287** *L* **13** # 274

Li, Mike Intel

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

dw TBD

SuggestedRemedy

Replace it w 6,
see lim_3dj_01_2405, slide 5

Proposed Response *Response Status* **O**

Cl **178** *SC* **178.10.1** *P* **287** *L* **13** # 275

Li, Mike Intel

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

Nfix TBD

SuggestedRemedy

Replace it w 24,
see lim_3dj_01_2405, slide 5

Proposed Response *Response Status* **O**

Cl **178** *SC* **178.10.1** *P* **287** *L* **15** # 276

Li, Mike Intel

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

Ng TBD

SuggestedRemedy

Replace it w 4,
see lim_3dj_01_2405, slide 5

Proposed Response *Response Status* **O**

Cl **178** *SC* **178.10.1** *P* **287** *L* **16** # 277

Li, Mike Intel

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

Nf TBD

SuggestedRemedy

Replace it w 5,
see lim_3dj_01_2405, slide 5

Proposed Response *Response Status* **O**

Cl **178** *SC* **178.10.1** *P* **287** *L* **17** # 278

Li, Mike Intel

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

Namx TBD

SuggestedRemedy

Replace it w 60,
see lim_3dj_01_2405, slide 5

Proposed Response *Response Status* **O**

Cl **178** *SC* **178.10.1** *P* **287** *L* **18** # 279

Li, Mike Intel

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

Wamx(j) TBD

SuggestedRemedy

Replace it w 0.7,
see lim_3dj_01_2405, slide 5

Proposed Response *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **279** Page 53 of 118
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Cl **178**　　*SC* **178.10.1**　　　　*P* **287**　　　*L* **19**　　　# 280

Li, Mike　　　　　　　　　　　　　Intel

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

Wmin(j) TBD

SuggestedRemedy

Replace it w -0.7,
see lim_3dj_01_2405, slide 5

Proposed Response　　　*Response Status* **O**

Cl **178**　　*SC* **178.10.1**　　　　*P* **287**　　　*L* **20**　　　# 281

Li, Mike　　　　　　　　　　　　　Intel

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

bmaxTBD

SuggestedRemedy

Replace it w 0.85,
see lim_3dj_01_2405, slide 5

Proposed Response　　　*Response Status* **O**

Cl **178**　　*SC* **178.10.1**　　　　*P* **287**　　　*L* **21**　　　# 282

Li, Mike　　　　　　　　　　　　　Intel

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

bminTBD

SuggestedRemedy

Replace it w 0.3,
see lim_3dj_01_2405, slide 5

Proposed Response　　　*Response Status* **O**

Cl **178**　　*SC* **178.10.1**　　　　*P* **287**　　　*L* **22**　　　# 283

Li, Mike　　　　　　　　　　　　　Intel

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

no foaltoing tap coefficient max limit

SuggestedRemedy

Added a new line for floating tap coefficeint max limit and set it to 0.05
see lim_3dj_01_2405, slide 5

Proposed Response　　　*Response Status* **O**

Cl **178**　　*SC* **178.10.1**　　　　*P* **287**　　　*L* **23**　　　# 284

Li, Mike　　　　　　　　　　　　　Intel

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

no foaltoing tap coefficient min limit

SuggestedRemedy

Added a new line for floating tap coefficeint min limit and set it to -0.05
see lim_3dj_01_2405, slide

Proposed Response　　　*Response Status* **O**

Cl **178A**　　*SC* **178A.1.10.2**　　*P* **659**　　　*L* **12**　　　# 285

Li, Mike　　　　　　　　　　　　　Intel

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

DER0 EQ is wrong

SuggestedRemedy

change P(y0)= DER0 to 1-P(y0) =DER0, see slide 3 of lim_3dj_02_2405, see also a
marked version in the support data sheet.

Proposed Response　　　*Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected　　RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **285**

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5/3/2024 10:09:28 AM

Cl **178A**　　*SC* **178A.1.11**　　　　*P* **660**　　　　*L* **27**　　　# 286

Li, Mike　　　　　　　　　　　　　Intel

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

EQ (178A-36)

SuggestedRemedy

Update the equation per slide 4 of lim_3dj_02_2405, see also a marked version in the support data sheet.

Proposed Response　　　　*Response Status* **O**

Cl **178A**　　*SC* **178A.1.11**　　　　*P* **660**　　　　*L* **33**　　　# 287

Li, Mike　　　　　　　　　　　　　Intel

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

EQ (178A-37)

SuggestedRemedy

Update the equation per slide 4 of lim_3dj_02_2405, see also a marked version in the support data sheet.

Proposed Response　　　　*Response Status* **O**

Cl **178**　　*SC* **178.9.2**　　　　*P* **276**　　　　*L* **31**　　　# 288

Li, Mike　　　　　　　　　　　　　Intel

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

"value at min state for c(–1) (max) " from 802.3ck, parameter not suitable for 802.3dj at 200G/L, and no simod supports"

SuggestedRemedy

change it to -0.4, see lim_3dj_01_2405

Proposed Response　　　　*Response Status* **O**

Cl **176**　　*SC* **176.7.1.2.4**　　　*P* **225**　　　　*L* **1**　　　# 289

Galan, Jose Vicente　　　　　　　　Maxlinear Inc

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

In Figure 176-18, the output lane arrow is indicated in the opposite direction than the actual transmission order of the output PCSL symbols

SuggestedRemedy

Change the direction of the arrow to follow the actual transmission order.

Proposed Response　　　　*Response Status* **O**

Cl **176**　　*SC* **176.6.1.2.5**　　　*P* **216**　　　　*L* **1**　　　# 290

Galan, Jose Vicente　　　　　　　　Maxlinear Inc

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

In Figure 176-12, the output lane arrow is indicated in the opposite direction than the actual transmission order of the output PCSL symbols

SuggestedRemedy

Change the direction of the arrow to follow the actual transmission order.

Proposed Response　　　　*Response Status* **O**

Cl **176**　　*SC* **176.5.1.3.5**　　　*P* **204**　　　　*L* **1**　　　# 291

Galan, Jose Vicente　　　　　　　　Maxlinear Inc

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

In Figure 176-6, the output lane arrow is indicated in the opposite direction than the actual transmission order of the output PCSL symbols

SuggestedRemedy

Change the direction of the arrow to follow the actual transmission order.

Proposed Response　　　　*Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **291**

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5/3/2024 10:09:28 AM

Cl **177**　　*SC* **177.4.1**　　　　*P* **252**　　*L* **9**　　　# 292

Galan, Jose Vicente　　　　　　　Maxlinear Inc

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

The Q values of Convolutional interleaver are not in line with previous contributions, D0.1, D0.2, with the TP2 test vectors of Annex 177A and have to be corrected.

SuggestedRemedy

Q=24 for 1.6TBASE-R, Q=48 for 800GBASE-R, Q=96 for 400GBASE-R and Q=192 for 200GBASE-R

Proposed Response　　　　*Response Status* **O**

Cl **176**　　*SC* **176.5.1.3.4**　　*P* **203**　　*L* **4**　　　# 293

Galan, Jose Vicente　　　　　　　Maxlinear Inc

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

For Figure 176–5 , it has to be explained what A'/B' shall be.

SuggestedRemedy

Add an explanation for A'/B', e. g. "A'/B"are the symbols from previous 2 CWs that are delayed"

Proposed Response　　　　*Response Status* **O**

Cl **176**　　*SC* **176.7.1.2.2**　　*P* **224**　　*L* **38**　　　# 294

Galan, Jose Vicente　　　　　　　Maxlinear Inc

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

In all Figures in the 800G PMA section, it is referred to A'/B' symbols, although we have 4 RS CWs

SuggestedRemedy

Change to use A,B,C,D for the 4 RS CWs, instead of A, B, A', B'

Proposed Response　　　　*Response Status* **O**

Cl **177**　　*SC* **177.4.1**　　　　*P* **252**　　*L* **18**　　　# 295

Galan, Jose Vicente　　　　　　　Maxlinear Inc

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

Usually, a convolutional interleaver switches round-robin from low to high delay lines and the convolutional de-interleaver switches round-robin from high to low delay lines. Why in Figure 177-3 it is defined the other way round?

SuggestedRemedy

Change the convolutional interleaver order if that is the case.

Proposed Response　　　　*Response Status* **O**

Cl **177**　　*SC* **177.4.6**　　　　*P* **254**　　*L* **33**　　　# 296

Galan, Jose Vicente　　　　　　　Maxlinear Inc

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

It is not declared when the first pad insertion should happen.

SuggestedRemedy

Indicate in the text that the first pad insertion will happen right at the beginning of CWs, same as in the test vectors.

Proposed Response　　　　*Response Status* **O**

Cl **177**　　*SC* **177.4.6.2**　　*P* **255**　　*L* **49**　　　# 297

Galan, Jose Vicente　　　　　　　Maxlinear Inc

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

The details of how ot use the IBSF are beyond the scope of this standard. Does it mean this is vendor discretionary ? Or will it be defined in other standard ?

SuggestedRemedy

Clarify in the text where the use of the IBSF will be defined.

Proposed Response　　　　*Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected　　RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **297**

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5/3/2024 10:09:28 AM

Cl **176**   *SC* **176C**   *P* **594**   *L* **1**   *#* 298

Loewenthal, Arnon   alphawave semi

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

Annex 176C "SM-PMA test vectors" is currently empty.

SuggestedRemedy

Add test vectors for 200GBASE-R 8:1, 400GBASE-R 16:2, 800GBASE-R 32:4, and 1.6TBASE-R 16:8 to Annex 176C based on supporting contribution on May interim.

Proposed Response   *Response Status* **O**

Cl **184**   *SC* **184.4.1**   *P* **445**   *L* **3**   *#* 299

Loewenthal, Arnon   alphawave semi

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

Need to further define the deskew requirement. For now it is defined as optional. In practice full deskew is optional, but doing 10b alignment of RS symbols is mandatory.

SuggestedRemedy

Replace lines 8-18 with the requirement of partial deskew, which means 10b RS symbols resolution deskew.

Proposed Response   *Response Status* **O**

Cl **184**   *SC* **184.4.2**   *P* **445**   *L* **19**   *#* 300

Loewenthal, Arnon   alphawave semi

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

Need to further define the lanes reorder requirement. For now it is defined as optional. In practice full lanes reorder is optional, but partial reorder, meaning having flow-0 on lanes 0-15 and flow-1 on lanes 16-31 is required. Not doing that would impact end to end FEC performance and margins.

SuggestedRemedy

Two options:
1. remove the word 'optional' from line 22.
2. Define the restriction of having flow-0 on lanes 0-15 and flow-1 on lanes 16-31.

Proposed Response   *Response Status* **O**

Cl **182**   *SC* **182.1**   *P* **392**   *L* **44**   *#* 301

Maki, Jeffery   Juniper Networks

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

Associated clause description is malformed. The acronym IMDD is used, which does not appear in the actual Clause 177 title. Why preclude that at some future point in time that Clause 177 is used for something other than IMDD? Also, there is no use of "Coherent" to describe Inner FECs used for coherent PMDs to setup the appropriate parallelism of terminology.

SuggestedRemedy

Delete the acronym IMDD.

Proposed Response   *Response Status* **O**

Cl **182**   *SC* **182.1**   *P* **393**   *L* **29**   *#* 302

Maki, Jeffery   Juniper Networks

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

Associated clause description is malformed. The acronym IMDD is used, which does not appear in the actual Clause 177 title. Why preclude that at some future point in time that Clause 177 is used for something other than IMDD? Also, there is no use of "Coherent" to describe Inner FECs used for coherent PMDs to setup the appropriate parallelism of terminology.

SuggestedRemedy

Delete the acronym IMDD.

Proposed Response   *Response Status* **O**

Cl **182**   *SC* **182.1**   *P* **394**   *L* **23**   *#* 303

Maki, Jeffery   Juniper Networks

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

Associated clause description is malformed. The acronym IMDD is used, which does not appear in the actual Clause 177 title. Why preclude that at some future point in time that Clause 177 is used for something other than IMDD? Also, there is no use of "Coherent" to describe Inner FECs used for coherent PMDs to setup the appropriate parallelism of terminology.

SuggestedRemedy

Delete the acronym IMDD.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Comment ID* **303**   Page 57 of 118
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   5/3/2024 10:09:28 AM
SORT ORDER: Comment ID

Cl **182**   *SC* **182.1**   *P* **394**   *L* **50**   # 304

Maki, Jeffery   Juniper Networks

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

Associated clause description is malformed. The acronym IMDD is used, which does not appear in the actual Clause 177 title. Why preclude that at some future point in time that Clause 177 is used for something other than IMDD? Also, there is no use of "Coherent" to describe Inner FECs used for coherent PMDs to setup the appropriate parallelism of terminology.

SuggestedRemedy

Delete the acronym IMDD.

Proposed Response   *Response Status* **O**

Cl **183**   *SC* **183.1**   *P* **418**   *L* **39**   # 305

Maki, Jeffery   Juniper Networks

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

Associated clause description is malformed. The acronym IMDD is used, which does not appear in the actual Clause 177 title. Why preclude that at some future point in time that Clause 177 is used for something other than IMDD? Also, there is no use of "Coherent" to describe Inner FECs used for coherent PMDs to setup the appropriate parallelism of terminology.

SuggestedRemedy

Delete the acronym IMDD.

Proposed Response   *Response Status* **O**

Cl **177A**   *SC* **177A**   *P* **643**   *L* **5**   # 306

Maki, Jeffery   Juniper Networks

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

Annex title unnecessarily uses the acronym IMDD. Not clear what purpose is achieved that cannot be achieved simply by omitting the use of the acronym IMDD.

SuggestedRemedy

Delete the acronym IMDD.

Proposed Response   *Response Status* **O**

Cl **184**   *SC* **184.6.5**   *P* **462**   *L* **3**   # 307

Bruckman, Leon   Huawei

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

Set TBD values of N and M

SuggestedRemedy

Set N=12, M=8. See contribution bruckman_3dj_01_241205

Proposed Response   *Response Status* **O**

Cl **184**   *SC* **184.1.1**   *P* **441**   *L* **8**   # 308

Bruckman, Leon   Huawei

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

The Inner FEC as defined, includes the PMA. Shall make this clear to the reader

SuggestedRemedy

Either add sentence: "This Inner FEC sublayer includes functionality often associated with the PMA sublayer", or split the PMA function

Proposed Response   *Response Status* **O**

Cl **1**   *SC* **1.4.184da**   *P* **49**   *L* **43**   # 309

D'Ambrosia, John   Futurewei, U.S. Subsidiary of Huawei

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

800GBASE-ER1 is defined as using 800GBASE-R encoding, but per 802.3df-2024, 1.4.184e - "The term 800GBASE-R represents a family of Physical Layer devices using the Physical Coding Sublayer (PCS) defined in Clause 172 for 800 Gb/s operation." This PHY as noted in Table 169-3a,uses PCS encoding as defined in Clause 186.

SuggestedRemedy

Define new name for family / encoding based on Clause 186 encoding.
Modify definition of entry for 800GBASE-ER1 to reflect new family name.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **309**

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Cl **1** *SC* **1.4.184da** *P* **49** *L* **47** *#* 310

D'Ambrosia, John Futurewei, U.S. Subsidiary of Huawei

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

800GBASE-ER1-20 is defined as using 800GBASE-R encoding, but per 802.3df-2024, 1.4.184e - "The term 800GBASE-R represents a family of Physical Layer devices using the Physical Coding Sublayer (PCS) defined in Clause 172 for 800 Gb/s operation." This PHY as noted in Table 169-3a,uses PCS encoding as defined in Clause 186.

SuggestedRemedy

Define new name for family / encoding based on Clause 186 encoding.
Modify definition of entry for 800GBASE-ER1 to reflect new family name.

Proposed Response *Response Status* **O**

Cl **116** *SC* **116.1.3** *P* **92** *L* **30** *#* 311

D'Ambrosia, John Futurewei, U.S. Subsidiary of Huawei

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

With the adoption of the objective to do 500m over 4 WDM lanes on a single mode fiber and its nomenclature 800GBASE-FR4-500, "FR" is no longer limited to just represent 2km (e.g. FR-500). This introduces an inconsistency for 200GBASE-FR1 and 200GBASE-DR1 (DR1 is not FR1-500).   In addition, when looking at 2km for 1,2,4,8 fibers- a confusing "family" of PHYs emerges (200GBASE-FR1, 400GBASE-DR2-2, 800GBASE-DR4-2, and 1.6TBASE-DR8-2)

SuggestedRemedy

Rename 200GBASE-FR1 to 200GBASE-DR1-2

Proposed Response *Response Status* **O**

Cl **116** *SC* **116.1.4** *P* **94** *L* **6** *#* 312

D'Ambrosia, John Futurewei, U.S. Subsidiary of Huawei

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

200/400G BASE-R BM-PMA and 200/400G BASE-R-SM-PMA are noted as optional in Tables 116-3, 116-4,and 116-4a, but that is not quite correct. They are conditional dependent on the PHY type and on whether specific AUIs are implemented or not. .

SuggestedRemedy

For 100Gb/s based PHYs the 200GBASE-R BM-PMA is mandatory, all AUIs are optional, and 200GBASE R SM PMA is "C" / conditional if either 200GAUI-1 is implemented.
For 200Gb/s based PHYs the 200GBASE-R SM-PMA is mandatory, all AUIs are optional, and 200GBASE R BM PMA is "C" / conditional if either 200GAUI-2 is implemented.

For 100Gb/s based PHYs the 400GBASE-R BM-PMA is mandatory, all AUIs are optional, and 400GBASE R SM PMA is "C" / conditional if either 400GAUI-2 is implemented.
For 200Gb/s based PHYs the 400GBASE-R SM-PMA is mandatory, all AUIs are optional, and 400GBASE R BM PMA is "C" / conditional if either 400GAUI-4 is implemented.

Change entries as described above in Tables 116-3, 116-4 and116-4a for 800GBASE-R BM-PMA and 800GBASE-R-SM-PMA to C / with notes as stated above
Modify entry in Table 178-1 to 200GBASE-R BM PMA to Conditional. Add note "c" A 200GBASE-R BM PMA must be implemented if a 200GAUI-2 C2C is implemented.
Modify entry in Table 178-2 to 400GBASE-R BM PMA to Conditional. Add note "c" A 400GBASE-R BM PMA must be implemented if a 400GAUI-4 C2C is implemented.
Modify entry in Table 179-1 to 200GBASE-R SM PMA to Conditional. Add note "c" A 200GBASE-R SM PMA must be implemented if a 200GAUI-1 C2C is implemented.
Modify entry in Table 179-2 to 400GBASE-R SM PMA to Conditional. Add note "c" A 400GBASE-R SM PMA must be implemented if a 400GAUI-2 C2C is implemented.
Modify entry in Table 181-1 to 200GBASE-R BM PMA to Conditional. Add note "c" A 200GBASE-R BM PMA must be implemented if a 200GAUI-2 C2C/C2M is implemented.
Modify entry in Table 180-2 to 400GBASE-R BM PMA to Conditional. Add note "c" A 400GBASE-R BM PMA must be implemented if a 400GAUI-4 C2C/C2M is implemented.
Modify entry in Table 182-1 to 200GBASE-R BM PMA to Conditional. Add note "c" A 200GBASE-R BM PMA must be implemented if a 200GAUI-2 C2C/C2M is implemented.
Modify entry in Table 182-2 to 400GBASE-R BM PMA to Conditional. Add note "c" A 400GBASE-R BM PMA must be implemented if a 400GAUI-4 C2C/C2M is implemented.

Proposed Response *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **312** Page 59 of 118
5/3/2024 10:09:28 AM

Cl **116**　　　*SC* **116.1.4**　　　*P* **98**　　　*L* **18**　　　# 313

D'Ambrosia, John　　　　　　　Futurewei, U.S. Subsidiary of Huawei

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

there is no PMD called 400GBASE-LR4

SuggestedRemedy

Change 400GBASE-LR4 to 400GBASE-LR4-6

Proposed Response　　　*Response Status*　**O**

Cl **116**　　　*SC* **116.2.4**　　　*P* **99**　　　*L* **1**　　　# 314

D'Ambrosia, John　　　　　　　Futurewei, U.S. Subsidiary of Huawei

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

In support of 200 Gb/s per lane signaling - 200GBASE-R BM-PMA and 400GBASE-R PMA, Clause 176 was developed. No addition was made to 116.2 Summary of 200GbE and 400 GbE sublayers was made.

SuggestedRemedy

Modify last sentence of 116.2.4 and add additional text
The 200GBASE-R and 400GBASE-R PMAs, which supports bit multiplexing, is specified in Clause 120.
The 200GBASE-R and 400GBASE-R PMAs, which supports symbol multiplexing, is specified in Clause 176.
Note that "PMA" is used as a general term to represent both types of PMAs for each speed.

Proposed Response　　　*Response Status*　**O**

Cl **169**　　　*SC* **169.1.3**　　　*P* **116**　　　*L* **42**　　　# 315

D'Ambrosia, John　　　　　　　Futurewei, U.S. Subsidiary of Huawei

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

800GBASE-ER1-20 and 800GBASE-ER1 are both defined as using 800GBASE-R encoding, but per 802.3df-2024, 1.4.184e - "The term 800GBASE-R represents a family of Physical Layer devices using the Physical Coding Sublayer (PCS) defined in Clause 172 for 800 Gb/s operation." These two PHYs as noted in Table 169-3a, they use PCS encoding as defined in Clause 186.

SuggestedRemedy

Define new name for family / encoding based on Clause 186 encoding.
Eliminate table entries for ER1-20 and ER1 from Table 169-3a.
Create new table for PHY type and clause correlation for new family based on Clause 186 encoding.
Modify description of entry for 800GBASE-ER1-20 in Table 169-1 to reflect new family name.
Modify description of entry for 800GBASE-ER1 in Table 169-1 to reflect new family name.

Proposed Response　　　*Response Status*　**O**

Cl **169**　　　*SC* **169.1.4**　　　*P* **117**　　　*L* **12**　　　# 316

D'Ambrosia, John　　　　　　　Futurewei, U.S. Subsidiary of Huawei

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

Table 169-2 introduces the 800GBASE-R BM-PMA and 800GBASE-R-SM-PMA in Table 169-2, but there is no real explanation to the use of the sub-layers - just the required PMA service interfaces, as noted in Items C&E. The clarification of these two sublayers is actually defined in 176.2 Conventions, which doesnt make sense.

SuggestedRemedy

Move definitions of 800GBASE-R BM-PMA and 800GBASE-R-SM-PMA from 176.2 to 169.1.3 Nomenclature

Proposed Response　　　*Response Status*　**O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected　　　RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **316**

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5/3/2024 10:09:28 AM

Cl **169**   *SC* **169.1.4**   *P* **117**   *L* **12**   # 317

D'Ambrosia, John   Futurewei, U.S. Subsidiary of Huawei

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

800GBASE-R BM-PMA and 800GBASE-R-SM-PMA are noted as optional in Tables 169-2, 169-3, and Table 169-3a, but that is not quite correct. They are conditional dependent on the PHY type and on whether specific AUIs are implemented or not. .

SuggestedRemedy

For 100Gb/s based PHYs the 800GBASE-R BM-PMA is mandatory, all AUIs are optional, and 800GBASE R SM PMA is "C" / conditional if either 800GAUI-4 is implemented.
For 200Gb/s based PHYs the 800GBASE-R SM-PMA is mandatory, all AUIs are optional, and 800GBASE R BM PMA is "C" / conditional if either 800GAUI-8 is implemented.

Change entries as described above in Tables 169-2, 169-3 and 169-3a for 800GBASE-R BM-PMA and 800GBASE-R-SM-PMA to C / with notes as stated above.

Modify entry in Table 178-3 to 800GBASE-R BM PMA to Conditional. Add note "c" A 800GBASE-R BM PMA must be implemented if a 800GAUI-8 C2C is implemented.
Modify entry in Table 179-3 to 800GBASE-R SM PMA to Conditional. Add note "c" A 800GBASE-R SM PMA must be implemented if a 800GAUI-4 C2C is implemented.
Modify entry in Table 180-3 to 800GBASE-R BM PMA to Conditional. Add note "c" A 800GBASE-R BM PMA must be implemented if a 800GAUI-8 C2C/C2M is implemented.
Modify entry in Table 181-1 to 800GBASE-R BM PMA to Conditional. Add note "c" A 800GBASE-R BM PMA must be implemented if a 800GAUI-8 C2C/C2M is implemented.
Modify entry in Table 182-3 to 800GBASE-R BM PMA to Conditional. Add note "c" A 800GBASE-R BM PMA must be implemented if a 800GAUI-8 C2C/C2M is implemented.
Modify entry in Table 183-1 to 800GBASE-R BM PMA to Conditional. Add note "c" A 800GBASE-R BM PMA must be implemented if a 800GAUI-8 C2C/C2M is implemented.

Proposed Response   *Response Status* **O**

Cl **169**   *SC* **169.2**   *P* **119**   *L* **28**   # 318

D'Ambrosia, John   Futurewei, U.S. Subsidiary of Huawei

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

In support of 200 Gb/s per lane signaling - 800GBASE-R BM-PMA, Clause 176 was developed. No addition was made to 169.2 Summary of 800 GbE archicture

SuggestedRemedy

Modify 169.2.4 to read -
The PMA sublayer provides a medium-independent means to support the use of a range of physical media.
The 800GBASE-R PMA, which supports bit multiplexing, is specified in Clause 173.
The 800GBASE-R PMA, which supports symbol multiplexing , is specified in Clause 176.
Note that "PMA" is used as a general term to represent both types of PMAs.

Proposed Response   *Response Status* **O**

Cl **169**   *SC* **169.2**   *P* **119**   *L* **28**   # 319

D'Ambrosia, John   Futurewei, U.S. Subsidiary of Huawei

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

800GBASE-ER1 and 800GBASE-ER1-20 use the Clause 186 800GBASE-ER1 PCS/PMA. This layer is not described as part of 169.2.

SuggestedRemedy

Create 169.2.4c 800GBASE-ER1 PCS/PMA
The 800GBASE-ER1 PCS performs encoding of data from the 800GMII, performs GMP mapping, applies FEC, and transfers the encoded data to the PMA. The 800GBASE-ER1 PMA sublayer perform the mapping of transmit and receive data streams between the PCS and PMA via the PMA service interface, and the mapping and multiplexing of transmit and receive data streams between the PMA and PMD via the PMD service interface.
The 800GBASE-ER1 PCS is specified in Clause xxx.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Comment ID* **319**   Page 61 of 118
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   5/3/2024 10:09:28 AM
SORT ORDER: Comment ID

Cl **169**　　*SC* **169.1.3**　　　　　*P***119**　　*L***19**　　# 320

D'Ambrosia, John　　　　　　　Futurewei, U.S. Subsidiary of Huawei

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

For 800GBASE-LR1 in Table 169-3a
800GBASE-R BM-PMA is conditional, pending implementation of 800GAUI-8 C2C/C2M
800GBASE-R SM PMA is conditional, pending implementation of 800GAUI-4 C2C/C2M

SuggestedRemedy

Change entries for 800GBASE-LR1 to C for 800GBASE-R BM-PMA and 800GBASE-R SM-PMA
Add note "C= Conditional, 800GBASE-R BM-PMA is conditional, pending implementation of 800GAUI-8 C2C/C2M
800GBASE-R SM PMA is conditional, pending implementation of 800GAUI-4 C2C/C2M"

Proposed Response　　　*Response Status* **O**

Cl **169**　　*SC* **169.3.2**　　　　　*P***122**　　*L***54**　　# 321

D'Ambrosia, John　　　　　　　Futurewei, U.S. Subsidiary of Huawei

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

There is no figure describing 800GBASE-ER1/-20 describing inter-sublayer service interaces including 800GBASE-ER1 PCS/PMA

SuggestedRemedy

Add placeholder text for future text.

Proposed Response　　　*Response Status* **O**

Cl **169**　　*SC* **169.3.2**　　　　　*P***122**　　*L***14**　　# 322

D'Ambrosia, John　　　　　　　Futurewei, U.S. Subsidiary of Huawei

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

There is no inter-sublayer interface for the PMA sublayer shown in the figure

SuggestedRemedy

Add placeholder text for future text.

Proposed Response　　　*Response Status* **O**

Cl **185**　　*SC* **185.1**　　　　　*P***468**　　*L***19**　　# 323

D'Ambrosia, John　　　　　　　Futurewei, U.S. Subsidiary of Huawei

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

Table 185-1, Figure 185-1, Figure 185-2 does not reflect the PHY type and clause correlation in Table 169-3a. There is no mention of 800GBASE-R BM-PMA, 800GAU-I8 2C2, 800GAUI-8 C2M, 800GBASE SM-PMA, 800GAUI-4 C2C, and 800GAUI-4 C2M.

Baseline Proposal in https://www.ieee802.org/3/dj/public/23_07/kota_3dj_01a_2307.pdf shows support for 800GAUI's.

SuggestedRemedy

Clause 185 needs to be updated to reflect these layers.
Table185-1needs the following entries -
　　800GBASE-R BM-PMA - conditional
　　800GAU-I8 2C2 - optional
　　800GAUI-8 C2M - optional
　　800GBASE SM-PMA - conditional
　　800GAUI-4 C2C - optional
　　800GAUI-4 C2M - optional
Add note "C= Conditional, 800GBASE-R BM-PMA is conditional, pending implementation of 800GAUI-8 C2C/C2M
800GBASE-R SM PMA is conditional, pending implementation of 800GAUI-4 C2C/C2M"

Figure 185-1 should include a PMA sublayer in the diagram and be added to legend below
FIgure 185-2 needs to be updated to show the 800GBASE-R PMA Sublayer and service interface between the PCS and Inner FEC

Proposed Response　　　*Response Status* **O**

Cl **180**　　*SC* **180.8.5**　　　　　*P***364**　　*L***39**　　# 324

Welch, Brian　　　　　　　Cisco

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

Current baseline proposal is lacking tap weight restrictions, which were indicated as TBD when adopted.

SuggestedRemedy

Propose adopting the TDECQ tap weight restrictions as presented in welch_3dj_01_0524.

Proposed Response　　　*Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected　　　RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **324**　　　Page 62 of 118
5/3/2024 10:09:28 AM

Cl **181**   *SC* **181.8.5**   *P* **387**   *L* **3**   *#* 325

Welch, Brian   Cisco

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

Current baseline proposal is lacking tap weight restrictions, which were indicated as TBD when adopted.

SuggestedRemedy

Propose adopting the TDECQ tap weight restrictions as presented in welch_3dj_01_0524.

Proposed Response   *Response Status* **O**

Cl **180**   *SC* **180.6.1**   *P* **353**   *L* **33**   *#* 326

Welch, Brian   Cisco

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

In later 100GPL specs (ie, 100GBASE-FR1) the difference between OMA(min) and Pave(min) was 3dB, to reflect the case of infinite extinction ratio. In the adopted baselines this narrowed to 2.5 dB as it was not updated to reflect the changes to effective TDECQ(min).

SuggestedRemedy

Propose changing "Average launch power, each lane (min)" in Table 180-7 from -2.8 dBm to -3.3 dBm.

Proposed Response   *Response Status* **O**

Cl **181**   *SC* **181.6.1**   *P* **378**   *L* **16**   *#* 327

Welch, Brian   Cisco

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

In later 100GPL specs (ie, 400GBASE-FR4) the difference between OMA(min) and Pave(min) was 3dB, to reflect the case of infinite extinction ratio. In the adopted baselines this narrowed to 2.6 dB as it was not updated to reflect the changes to effective TDECQ(min).

SuggestedRemedy

Propose changing "Average launch power, each lane (min)" in Table 181-5 from -1.8 dBm to -2.2 dBm.

Proposed Response   *Response Status* **O**

Cl **182**   *SC* **182.6.1**   *P* **401**   *L* **21**   *#* 328

Welch, Brian   Cisco

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

In later 100GPL specs (ie, 100GBASE-FR1) the difference between OMA(min) and Pave(min) was 3dB, to reflect the case of infinite extinction ratio. In the adopted baselines this narrowed to 2.5 dB as it was not updated to reflect the changes to effective TDECQ(min).

SuggestedRemedy

Propose changing "Average launch power, each lane (min)" in Table 182-7 from -2.1 dBm to -2.6 dBm.

Proposed Response   *Response Status* **O**

Cl **183**   *SC* **183.6.1**   *P* **425**   *L* **19**   *#* 329

Welch, Brian   Cisco

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

In later 100GPL specs (ie, 400GBASE-FR4) the difference between OMA(min) and Pave(min) was 3dB, to reflect the case of infinite extinction ratio. In the adopted baselines this narrowed to 2.6 dB as it was not updated to reflect the changes to effective TDECQ(min).

SuggestedRemedy

Propose changing "Average launch power, each lane (min)" in Table 183-6 from -1.8 dBm to -2.2 dBm.

Proposed Response   *Response Status* **O**

Cl **90A**   *SC* **90A.3**   *P* **519**   *L* **43**   *#* 330

de Koos, Andras   Microchip Technology

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

For the added row in Table 90A-1, the potential timestamp accuracy impairment due to alignment marker insertion/removal for 1.6T is incorrect. It should be 1.28ns, not 2.56ns. The values for 200G, 400G, and 800G are also erroneous (should all be 5.12ns). I've filed a maintenance request to correct these, too.

SuggestedRemedy

Change 2.56 to 1.28ns in the added row for Table 90A-1

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
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Comment ID **330**   Page 63 of 118
5/3/2024 10:09:28 AM

Cl **175**   *SC* **175.2.4.5**   *P***173**   *L***50**   # 331

de Koos, Andras   Microchip Technology

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

Different scrambler seeds for the two flows are NOT strictly necessary for the 1.6TBASE-R
PCS. The output PCSLs are never bit muxed, so having identical outputs from FEC A and
FEC C, for example, should never have any adverse effect on "clock content" of the
SerDes output.
It doesn't hurt to have the scramblers be seeded differently, however.

SuggestedRemedy

Consider changing the last sentence on page 173 from:
When reset is asserted, the two scramblers shall be initialized to a value other than zero
and different from each other.
To:
When reset is asserted, the two scramblers shall be initialized to values other than zero.

(snuck in an editorial correction there, too!)

Proposed Response   *Response Status* **O**

Cl **175**   *SC* **175**   *P***169**   *L***1**   # 332

de Koos, Andras   Microchip Technology

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

Has any thought been given to how to calculate the latency through the 1.6TBASE-R PCS,
i.e. the path data delay values for the purposes of TimeSync?
I do not see anything within the 1.6TBASE-R PCS that would prevent proper calculation of
the path data delay values.
Clause 90.7.1 is instructive here, explaining that the path data delays should be "reported
as if the DDMP is at the start of the FEC codeword". However, the existing language in
90.7.1 is awkward for PCSs with more than one FEC engine like the 1.6TBASE-R PCS,
which has four FEC codewords in parallel.

SuggestedRemedy

No proposed change to Clause 175.
Clause 90.7.1 could be cleaned up to account for when there are multiple FEC codewords
in parallel, but I assume that is out-of-scope for the 802.3dj project? I'll submit a
maintenance request.

Proposed Response   *Response Status* **O**

Cl **119**   *SC* **119.2.4.1**   *P***111**   *L***26**   # 333

de Koos, Andras   Microchip Technology

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

I understand why the use of the stateless encoder decoder is restricted to 200GBASE-R,
and 400GBASE-R over 200Gbps lanes. Allowing it on other PMDs/AUIs would be out-of-
scope for the 802.3dj project.
HOWEVER, shouldn't common sense prevail, here?
The stateless encoder/decoder was designed such that it is all-but-identical to the stateful
encoder, only differing in their treatment of /E/ blocks. Since the 200GBASE-R and
400GBASE-R links are always protected by FEC, it is not as if /E/ blocks can occur at
random causing divergent behaviour of the two encoder/decoder types.
There is absolutely no danger of causing backward-compatibility issues, becasue the
stateful encoder/decoder are still allowed for all PMDs
The stateless encoder/decoder was added to the standard to allow greater implementation
flexibility (removing long timing paths). But any new PCS implementation that may attach
to either 100Gbps/lane or 200Gbps/lane PMDs would have to implement the stateful
encoder/decoder! With the stateless encoder, the standard is offering more
implementation flexibility that implemetors cannot actually use.

SuggestedRemedy

Consider removing the restriction on PMD type when using the stateless encoder and
decoder in subclauses 119.2.4.1 and 119.2.5.8, respectively.

Proposed Response   *Response Status* **O**

Cl **186**   *SC* **186**   *P***491**   *L***1**   # 334

de Koos, Andras   Microchip Technology

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

ER1 PCS: Planting the seed for when the PCS is ready to be properly reviewed.
How to calculate the path data delay across the ER1 PCS/PMA? Clause 90 and Annex
90A give general rules, like how to calculate the rx/tx path data delay when there are
functions within the PHY that introduce cyclical delay.
But the path data delay in the ER1 PCS is very different from anything that has been
imagined in Clause 90 - an Ethernet stream that floats within a GMP frame will present
unique challenges; it is not immediately clear how to determine the min/max latency across
such a PCS.
This might be worse than the Alignment marker issue!

SuggestedRemedy

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
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Comment ID **334**

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Cl **180**   *SC* **180.7.1**   *P* **358**   *L* **28**   # 335

Ferretti, Vince   Corning

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

ITU-T G.652.B cabled fiber attenuation is only specified for 1310 nm and 1550 nm wavelengths. It is not specified for wavelengths between 1260 nm and 1310 nm and not meant to be used in xWDM applications

SuggestedRemedy

Remove ITU-T G.652.B (dispersion unshifted) as a fiber option.

Proposed Response   *Response Status* **O**

Cl **181**   *SC* **181.7.1**   *P* **383**   *L* **26**   # 336

Ferretti, Vince   Corning

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

ITU-T G.652.B cabled fiber attenuation is only specified for 1310 nm and 1550 nm wavelengths. It is not specified for wavelengths between 1260 nm and 1310 nm and not meant to be used in xWDM applications

SuggestedRemedy

Remove ITU-T G.652.B (dispersion unshifted) as a fiber option.

Proposed Response   *Response Status* **O**

Cl **182**   *SC* **182.7.1**   *P* **405**   *L* **31**   # 337

Ferretti, Vince   Corning

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

ITU-T G.652.B cabled fiber attenuation is only specified for 1310 nm and 1550 nm wavelengths. It is not specified for wavelengths between 1260 nm and 1310 nm and not meant to be used in xWDM applications

SuggestedRemedy

Remove ITU-T G.652.B (dispersion unshifted) as a fiber option.

Proposed Response   *Response Status* **O**

Cl **180**   *SC* **180.7.3.2**   *P* **361**   *L* **9**   # 338

Lambert, Angie   Corning

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

IEC 61753-1-1 has been superseded by IEC 61753-1.

SuggestedRemedy

Change "IEC 61753-1-1" to "IEC 61753-1"

Proposed Response   *Response Status* **O**

Cl **180**   *SC* **180.7.3.2**   *P* **361**   *L* **9**   # 339

Lambert, Angie   Corning

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

IEC 61753-021-2 has been superseded by IEC 61753-021-02.

SuggestedRemedy

Change "IEC 61753-021-2" to "IEC 61753-021-02".

Proposed Response   *Response Status* **O**

Cl **180**   *SC* **180.7.3.3**   *P* **361**   *L* **42**   # 340

Lambert, Angie   Corning

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

IEC 61753-021-2 has been superseded by IEC 61753-021-02.

SuggestedRemedy

Change "IEC 61753-021-2" to "IEC 61753-021-02".

Proposed Response   *Response Status* **O**

Cl **180**   *SC* **180.7.3.4**   *P* **361**   *L* **50**   # 341

Lambert, Angie   Corning

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

IEC 61753-021-2 has been superseded by IEC 61753-021-02.

SuggestedRemedy

Change "IEC 61753-021-2" to "IEC 61753-021-02".

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Comment ID* **341**   Page 65 of 118
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   5/3/2024 10:09:28 AM
SORT ORDER: Comment ID

Cl **180**　　*SC* **180.9.1**　　　　*P***366**　　　*L***31**　　　# 342

Lambert, Angie　　　　　　　　　Corning

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

IEC 60950-1 has been superseded by IEC 62368-1.

SuggestedRemedy

Change "IEC 60950-1" to "IEC 63268-1".

Proposed Response　　　*Response Status* **O**

Cl **181**　　*SC* **181.7.3**　　　　*P***384**　　　*L***43**　　　# 343

Lambert, Angie　　　　　　　　　Corning

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

IEC 61753-021-2 has been superseded by IEC 61753-021-02.

SuggestedRemedy

Change "IEC 61753-021-2" to "IEC 61753-021-02".

Proposed Response　　　*Response Status* **O**

Cl **182**　　*SC* **182.7.3**　　　　*P***406**　　　*L***45**　　　# 344

Lambert, Angie　　　　　　　　　Corning

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

IEC 61753-1-1 has been superseded by IEC 61753-1.

SuggestedRemedy

Change "IEC 61753-1-1" to "IEC 61753-1"

Proposed Response　　　*Response Status* **O**

Cl **182**　　*SC* **182.7.3**　　　　*P***406**　　　*L***45**　　　# 345

Lambert, Angie　　　　　　　　　Corning

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

IEC 61753-021-2 has been superseded by IEC 61753-021-02.

SuggestedRemedy

Change "IEC 61753-021-2" to "IEC 61753-021-02".

Proposed Response　　　*Response Status* **O**

Cl **182**　　*SC* **182.7.3.2**　　　*P***408**　　　*L***22**　　　# 346

Lambert, Angie　　　　　　　　　Corning

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

IEC 61753-1-1 has been superseded by IEC 61753-1.

SuggestedRemedy

Change "IEC 61753-1-1" to "IEC 61753-1"

Proposed Response　　　*Response Status* **O**

Cl **182**　　*SC* **182.7.3.2**　　　*P***408**　　　*L***22**　　　# 347

Lambert, Angie　　　　　　　　　Corning

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

IEC 61753-021-2 has been superseded by IEC 61753-021-02.

SuggestedRemedy

Change "IEC 61753-021-2" to "IEC 61753-021-02".

Proposed Response　　　*Response Status* **O**

Cl **182**　　*SC* **182.7.3.3**　　　*P***409**　　　*L***1**　　　# 348

Lambert, Angie　　　　　　　　　Corning

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

IEC 61753-021-2 has been superseded by IEC 61753-021-02.

SuggestedRemedy

Change "IEC 61753-021-2" to "IEC 61753-021-02".

Proposed Response　　　*Response Status* **O**

Cl **182**　　*SC* **182.7.3.4**　　　*P***409**　　　*L***8**　　　# 349

Lambert, Angie　　　　　　　　　Corning

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

IEC 61753-021-2 has been superseded by IEC 61753-021-02.

SuggestedRemedy

Change "IEC 61753-021-2" to "IEC 61753-021-02".

Proposed Response　　　*Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected　　RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **349**

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5/3/2024 10:09:28 AM

Cl **182**   *SC* **182.9.1**   *P* **413**   *L* **43**   # 350

Lambert, Angie   Corning

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

    IEC 60950-1 has been superseded by IEC 62368-1.

SuggestedRemedy

    Change "IEC 60950-1" to "IEC 63268-1".

Proposed Response   *Response Status* **O**

Cl **183**   *SC* **183.7.3**   *P* **432**   *L* **40**   # 351

Lambert, Angie   Corning

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

    IEC 61753-021-2 has been superseded by IEC 61753-021-02.

SuggestedRemedy

    Change "IEC 61753-021-2" to "IEC 61753-021-02".

Proposed Response   *Response Status* **O**

Cl **185**   *SC* **185.6.3**   *P* **480**   *L* **52**   # 352

Lambert, Angie   Corning

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

    IEC 61753-021-2 has been superseded by IEC 61753-021-02.

SuggestedRemedy

    Change "IEC 61753-021-2" to "IEC 61753-021-02".

Proposed Response   *Response Status* **O**

Cl **185**   *SC* **185.11.4.6**   *P* **490**   *L* **27**   # 353

Lambert, Angie   Corning

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

    IEC 61753-021-2 has been superseded by IEC 61753-021-02.

SuggestedRemedy

    Change "IEC 61753-021-2" to "IEC 61753-021-02".

Proposed Response   *Response Status* **O**

Cl **187**   *SC* **187.6.3**   *P* **504**   *L* **48**   # 354

Lambert, Angie   Corning

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

    IEC 61753-021-2 has been superseded by IEC 61753-021-02.

SuggestedRemedy

    Change "IEC 61753-021-2" to "IEC 61753-021-02".

Proposed Response   *Response Status* **O**

Cl **187**   *SC* **187.11.4.6**   *P* **514**   *L* **25**   # 355

Lambert, Angie   Corning

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

    IEC 61753-021-2 has been superseded by IEC 61753-021-02.

SuggestedRemedy

    Change "IEC 61753-021-2" to "IEC 61753-021-02".

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.10.1**   *P* **285**   *L* **19**   # 356

Healey, Adam   Broadcom Inc.

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

    In Table 178-12, the transmission line parameter "tau" is set to 6.141e-4. In the adopted baseline proposal li_3dj_01a_2311 (slides 8 and 9), the value is specified to be 6.141e-3.

SuggestedRemedy

    Replace the "tau" values in the Table 178-12 with the adopted value 6.141e-3 (2 instances). Similarly in Table 179-15 and Table 176D-6.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **356**   Page 67 of 118
5/3/2024 10:09:28 AM

Cl **178**   *SC* **178.10.1**   *P* **285**   *L* **31**   # 357

Healey, Adam   Broadcom Inc.

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

In Table 178-12, the transmision line parameters for the "Class B package model" do not match the adopted baseline proposal li_3dj_01a_2311 slide 9.

SuggestedRemedy

Replace the characteristic impedance for stage 1 with 92 Ohms, and the length/characterstic impedances for stage 2 through 4 with 70 Ohms/1 mm, 80 Ohm/1 mm, and 100 Ohm/0.5 mm respectively. Similarly in Table 179-15 and Table 176D-6.

Proposed Response   *Response Status* **O**

Cl **176A**   *SC* **176A.3**   *P* **553**   *L* **20**   # 358

Healey, Adam   Broadcom Inc.

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

Training pattern options have been added to give receiver additional flexibility to successfully complete training. However, that flexibility is limited by a menu of fixed combinations of encoding and test pattern options. It would be better if encoding and test pattern selections were separated to allow receivers to request whatever combination best suits their needs. There is space in the control and status field structures to accommodate this.

SuggestedRemedy

In Table 176A-2, restore bits in control field bits 8 and 9 to the original "Modulation and precoding request" encoding defined in Clause 162. Define bits 5 and 6 to be "Test pattern request" with 00=PRBS13, 01=Free-running PRBS13, 10=Reserved, and 11=Free-running PRBS31. Restore bits 10 and 11 in the status field (Table 176A-3) to the "Modulation and precoding status" encoding defined in Clause 162. Define bits 12 and 13 to be "Test pattern status" using the same encodings as the control field. Update Figure 176A-2, 176A.3.2, and 176A.10.3.1 accordingly. Also add subclauses corresponding the Modulation and precoding request/status fields.

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.10.1**   *P* **284**   *L* **27**   # 359

Healey, Adam   Broadcom Inc.

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

The reader may be tempted to interpret the parameters in Tables 178-12 and 178-13 as implementation requirements. E.g., "Receiver discrete-time equalizer parameters" may mistakenly be interpreted as requirements for receiver implementations. It would be worthwhile to add text here clarifying that the parameters represent a minimum level performance and that there is expected to be a variety of approaches to implementation that achieve this performance.

SuggestedRemedy

Add text stating the parameter values in the tables are chosen to represent the minimum required transmitter and receiver performance and they do not represent required implementation details. Compliant implementations are only required to meet or exceed this minimum level of performance. Similarly in 179.11.7 and 176.D.4.1.

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.10.1**   *P* **286**   *L* **11**   # 360

Healey, Adam   Broadcom Inc.

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

Parameters "f_min", "delta_f", and "M" are defined in Table 178-13 but are not used in Annex 178A. Any guidance on appropriate choices for measurement start frequency, frequency step, and simulation time step may be provided in a general way in Annex 178A (see, for example, 178A.1.3). The values for these parameters rarely, if ever, change and it seems unecessary to add a rows for them to an already lengthy table.

SuggestedRemedy

Remove these parameters from Table 178-13. Also remove these parameters from Tables 179-16 and Table 176D-7.

Proposed Response   *Response Status* **O**

Cl **176D**   *SC* **176D.3.3**   *P* **597**   *L* **33**   # 361

Healey, Adam   Broadcom Inc.

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

Typo.

SuggestedRemedy

Change "106.255" to "106.25".

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Comment ID* **361**   Page 68 of 118
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   5/3/2024 10:09:28 AM
SORT ORDER: Comment ID

Cl **178A**　　*SC* **178A.1.10**　　　　*P* **658**　　　*L* **43**　　　# **362**

Healey, Adam　　　　　　　　　　　Broadcom Inc.

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

The relationship between "detector error ratio", "PAM-L symbol error ratio", and "bit error ratio" is not documented and, as a result, not generally understood. While these quantities are related, they are not interchangeable. Prior assumptions that they are interchangeable has led to errors in the translation between COM results and expected (measured) receiver performance. This new annex gives us an opportunity to clarify the relationship between DER0 and other terms or to replace DER0 with a more generally understood term.

SuggestedRemedy

Slide 5 of <https://www.ieee802.org/3/dj/public/23_11/healey_3dj_01a_2311.pdf> suggest expressions for relationship between detector error ratio and other terms. Either replace "DER0" with a target PAM-4 symbol error ratio (or bit error ratio) and adjust the equations for calculating COM accordingly, or document the relationship between DER0 and the other two terms.

Proposed Response　　　　*Response Status*　**O**

Cl **178**　　*SC* **178.8.9**　　　　*P* **275**　　　*L* **33**　　　# **363**

Healey, Adam　　　　　　　　　　　Broadcom Inc.

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

The reference to 179.8.9 seems inappropriate here since that subclause contains cross-references specific to the Clause 179.

SuggestedRemedy

Replicate the content of 179.8.9 here, replacing references to Clause 179 electrical requirements to the corresponding references in Clause 178.

Proposed Response　　　　*Response Status*　**O**

Cl **178**　　*SC* **178.1**　　　　*P* **268**　　　*L* **45**　　　# **364**

Healey, Adam　　　　　　　　　　　Broadcom Inc.

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

The Annex 176A control function is required and should be included in Table 178-1 (as is done in Table 179-1).

SuggestedRemedy

Add "176A - Control" as "Required" in Tables 178-1, 178-2, 178-3, and 178-4.

Proposed Response　　　　*Response Status*　**O**

Cl **176E**　　*SC* **176E.5.2**　　　　*P* **633**　　　*L* **39**　　　# **365**

Healey, Adam　　　　　　　　　　　Broadcom Inc.

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

The title of Table 176E-7 suggests that is should contain reference receiver parameters. Many of the parameters in the table are not relevant to a reference receiver or an eye diagram measurement. It is understood that this may become moot if a different test method is adopted, but until this decision is made the table can be trimmed down to remove "TBDs" that will never need to be defined.

SuggestedRemedy

Remove parameters "maximum start frequency", "maximum frequency step", all "transmitter" parameters including "number of signal levels" and "level separation mismatch ratio", "number of samples per unit interval", and "target detector error ratio". It is also questionable whether device termination and package model parameters are needed (they were not used in Annex 120G).

Proposed Response　　　　*Response Status*　**O**

Cl **177**　　*SC* **177.4.1**　　　　*P* **252**　　　*L* **9**　　　# **366**

He, Xiang　　　　　　　　　　　Huawei

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

The Q values are not the same as the baseline adopted.

SuggestedRemedy

According to the adopted baseline, change the Q values as follows:
— 200G BASE-R: Q = 192
— 400G BASE-R: Q = 96
— 800G BASE-R: Q = 48
— 1.6T BASE-R: Q = 24

Proposed Response　　　　*Response Status*　**O**

Cl **176**　　*SC* **176.5.1.1**　　　　*P* **200**　　　*L* **11**　　　# **367**

He, Xiang　　　　　　　　　　　Huawei

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

20b deskew is incorrect. According to Motion #10 in https://www.ieee802.org/3/dj/public/23_07/motions_3cwdfdj_2307.pdf, it is required to deskew to codeword boundaries.

SuggestedRemedy

Change "20b deskew" to "deskew to codeword boundaries" or simply "deskew"

Proposed Response　　　　*Response Status*　**O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected　　RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **367**　　　Page 69 of 118
5/3/2024 10:09:28 AM

Cl **176**   *SC* **176.5.1.3.1**   *P* **201**   *L* **32**   # 368

He, Xiang   Huawei
Comment Type   **TR**   *Comment Status* **X**

20b deskew is incorrect. According to Motion #10 in
https://www.ieee802.org/3/dj/public/23_07/motions_3cwdfdj_2307.pdf, it is required to deskew to codeword boundaries.

SuggestedRemedy

Remove the second and third paragraph in 176.5.1.3.1 and reuse 119.2.5.1.

Proposed Response   *Response Status* **O**

Cl **30**   *SC* **30**   *P* **56**   *L* **33**   # 369

He, Xiang   Huawei
Comment Type   **TR**   *Comment Status* **X**

Add TimeSync entity managed object classes for Inner FEC sublayers defined in Clause 177 and 184.

SuggestedRemedy

Add register set for Inner FEC sublayers in subclauses of 30.13.1: (30.13.1.1 - 30.13.1.14)

(Presentation will be prepared for this comment.)

Proposed Response   *Response Status* **O**

Cl **45**   *SC* **45**   *P* **81**   *L* **9**   # 370

He, Xiang   Huawei
Comment Type   **TR**   *Comment Status* **X**

Add MDIO interface reigsters for Inner FEC sublayers defined in Clause 177 and 184.

SuggestedRemedy

Add definitions for the new register set defined for the Inner FEC sublayers in 30.3.1.1 - 30.1.1.14.

(Presentation will be prepared for this comment.)

Proposed Response   *Response Status* **O**

Cl **184**   *SC* **184.4.7.1**   *P* **450**   *L* **14**   # 371

He, Xiang   Huawei
Comment Type   **TR**   *Comment Status* **X**

It is said " 4-bit pilot symbols (PS) are inserted every 64 4-bit blocks (one 4-bit PS, 63 4-bit message blocks)."
But in Figure 184-5, message blocks m<0:63>, m<64-127>, …between pilot symbols has 64 4-bit blocks.

SuggestedRemedy

Change Figure to match the text, i.e., change m<0:63> to m<0:62>, change m<64:127> to m<63:125>, etc.

Proposed Response   *Response Status* **O**

Cl **184**   *SC* **184.6.5**   *P* **462**   *L* **1**   # 372

He, Xiang   Huawei
Comment Type   **TR**   *Comment Status* **X**

It is possible that one polarization is locked but the other polarization can not get locked.
With the current variable list and state diagrams this can not be identified or reported.
(This is a little different from AM lock process across PCS lanes, where it is way up in the sublayers higher than the pilot sequence lock, and it may not be a problem.)

SuggestedRemedy

Recommend to add a timer (value TBD) to indicate that it has waited long enough after one polarization is locked but the other is still not locked.

Proposed Response   *Response Status* **O**

Cl **184**   *SC* **184.8**   *P* **464**   *L* **10**   # 373

He, Xiang   Huawei
Comment Type   **TR**   *Comment Status* **X**

Only "alignment_valid" is reported, not individual "dsp_lock<x>" variables.

SuggestedRemedy

It is recommend to report both "dsp_lock<x>" in table 184-7, as we did for PCS lane lock where we reported "Lane x aligned" for all PCS lanes.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Comment ID* **373**   Page 70 of 118
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   5/3/2024 10:09:28 AM
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Cl **185**　　*SC* **185.7.1**　　　　*P***481**　　　*L***21**　　　# 374

He, Xiang　　　　　　　　　　　Huawei

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

The 800GBASE-LR1 Inner FEC would not see or use scrambled idles as its input. The input to the 800GBASE-LR1 Inner FEC should be "scrambled idle processed by 800GBASE-R PCS".

SuggestedRemedy

Change "pattern description" column in Table 185-9 to "Scrambled idle procedd by 800GBASE-R PCS and then encoded by the 800GBASE-LR1 Inner FEC".

Proposed Response　　　*Response Status*　**O**

Cl **185**　　*SC* **185.7.1**　　　　*P***481**　　　*L***21**　　　# 375

He, Xiang　　　　　　　　　　　Huawei

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

The scrambled idle test pattern for 800GBASE-R PCS is defined in 172.2.4.11, not 175.2.4.11.

SuggestedRemedy

Change "175.2.4.11" to "172.2.4.11" and format as external reference.

Proposed Response　　　*Response Status*　**O**

Cl **175**　　*SC* **175.2.1**　　　　*P***172**　　　*L***26**　　　# 376

Ofelt, David　　　　　　　　　　Juniper Networks

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

Text says to interleave two codewords from flow 0 and two from flow 1, but it isn't clear that those two should be from different FEC encoders.

SuggestedRemedy

After FEC encoding, a FEC codeword from each of the two encoders in flow 0 and a FEC codeword from each of the two encoders in flow 1 are then interleaved and distrubted to individual PCS lanes.

Proposed Response　　　*Response Status*　**O**

Cl **175**　　*SC* **175.2.4.5**　　　*P***174**　　　*L***3**　　　# 377

Ofelt, David　　　　　　　　　　Juniper Networks

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

Editor's Note asks if we should require different reset values for the scramblers.

SuggestedRemedy

Yes, we should!

Proposed Response　　　*Response Status*　**O**

Cl **176**　　*SC* **176.5.1.6.6**　　*P***207**　　　*L***6**　　　# 378

Ofelt, David　　　　　　　　　　Juniper Networks

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

Should there be an arc from ALIGNMENT_FAIL to LOSS_OF_ALIGNMENT?

SuggestedRemedy

If so, add the arc

Proposed Response　　　*Response Status*　**O**

Cl **176**　　*SC* **176.7.1**　　　　*P***221**　　　*L***20**　　　# 379

Maniloff, Eric　　　　　　　　　　Ciena

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

Table 176-7 Includes two references to 400GBASE-R, these should be replaced with 800GBASE-R

SuggestedRemedy

Replace the text "400GBASE-R" with "800GBASE-R" in Table 176-7.

Proposed Response　　　*Response Status*　**O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected　　RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
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Comment ID **379**　　　　Page 71 of 118
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Cl **185**　　*SC* **185.5.1**　　　　　*P***477**　　　*L* **8**　　　　# 380

Maniloff, Eric　　　　　　　　　　Ciena

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

800GBASE-LR1 is being defined to allow unlocked lasers with frequency errors larger than the DSP digital acquisition range. Additional parameters are required for the Tx laser to accommodate this. Values will be provided after further study, but the new paramaters can be added to Table 185-4. A supporting contribution will be provided.

SuggestedRemedy

Add the following parameters to Table 185-4:

Maximum Tx laser frequency slew rate: Preacquisition [Units GHz/s]

Maximum Tx laser frequency slew rate: Post acquisition [Units GHz/ms]

Laser Relative Frequency tracking accuracy [Units GHz]

Proposed Response　　　　　*Response Status*　**O**

Cl **185**　　*SC* **185.5.1**　　　　　*P***477**　　　*L* **8**　　　　# 381

Maniloff, Eric　　　　　　　　　　Ciena

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

The specification should have a Tx clock noise defined.

SuggestedRemedy

Add an entry for Tx clock phase noise (PN): Maximum PN mask

Add an entry for: Tx clock phase noise (PN); Maximum total integrated random jitter

Add an entry for: Tx clock phase noise (PN); Maximum total periodic jitter

Proposed Response　　　　　*Response Status*　**O**

Cl **185**　　*SC* **185.5.3**　　　　　*P***478**　　　*L* **43**　　　# 382

Maniloff, Eric　　　　　　　　　　Ciena

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

A value of -27dB is appropriate for Maximum discrete reflectance

SuggestedRemedy

Replace TBD for Maximum discrete reflectance with -27

Proposed Response　　　　　*Response Status*　**O**

Cl **185**　　*SC* **185.6**　　　　　*P***479**　　　*L* **51**　　　# 383

Maniloff, Eric　　　　　　　　　　Ciena

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

A value of 24dB is appropriate for Optical Return Loss

SuggestedRemedy

Replace TBD in Table 185-7 with 24

Proposed Response　　　　　*Response Status*　**O**

Cl **185**　　*SC* **185.5.1**　　　　　*P***477**　　　*L* **8**　　　　# 384

Maniloff, Eric　　　　　　　　　　Ciena

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

TQM is currently undefined. Recommend adopting RSNR Penalty as a TQM. Supporting Contribution to be provided.

SuggestedRemedy

Replace TQM with RSNR Penalty

Proposed Response　　　　　*Response Status*　**O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected　　RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
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Comment ID **384**

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Cl **171**   *SC* **171.5**   *P* **141**   *L* **47**   *#* 385

Nicholl, Gary   Cisco

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

There sentence below the editor's not is a repeat of what is captured in 171.3.2. It is also not related to "link fault signaling" as defined in 81.3.4, which is the topic of this subclause.

SuggestedRemedy

Delete the sentence below the editor's note.

Proposed Response   *Response Status* **O**

Cl **171**   *SC* **171.3**   *P* **137**   *L* **41**   *#* 386

Nicholl, Gary   Cisco

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

There is an issue with subclause 171.3.3 generated by 802.3df. There is an incorrect reference of "171.6.2" in the following bullets:

— An additional signal TXRD indicates the state of the rx_rm_degraded variable (see 171.6.2) as
detected by the PHY 800GXS in the transmit direction
— An additional signal TXLD indicates the state of the FEC_degraded_SER variable (see 171.6.2) as
detected by the PHY 800GXS in the transmit direction

SuggestedRemedy

Import subclause 171.3.3 and correct the two bullets as follows:

— An additional signal TXRD indicates the state of the rx_rm_degraded variable (see 172.2.6.2.2) as detected by the PHY 800GXS in the transmit direction
— An additional signal TXLD is the logical OR of the FEC_degraded_SER and rx_local_degraded variables (see 172.2.6.2.2) as
detected by the PHY 800GXS in the transmit direction.

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.9.3**   *P* **309**   *L* **14**   *#* 387

Kocsis, Sam   Amphenol

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

The reference impedance should match the system impedance, Rd as defined in COM spreadsheets.

SuggestedRemedy

92-ohm, TBD, or straw poll based on proposed values presented in Task Force contributions

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.9.4**   *P* **309**   *L* **23**   *#* 388

Kocsis, Sam   Amphenol

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

BT LP 3dB BW of "40GHz"

SuggestedRemedy

"TBD" as cited in other places of the document

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.11.1**   *P* **326**   *L* **27**   *#* 389

Kocsis, Sam   Amphenol

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

Nominal characteristic impedance of the cable assembly is "100-ohm"

SuggestedRemedy

Contributions to the task force have demonstrated the nominal characteristic impedance of the cable assembly is ~92-ohm

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **389**   Page 73 of 118
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Cl **179**　　*SC* **179.11.3**　　　　*P***327**　　　*L***34**　　　# 390

Kocsis, Sam　　　　　　　　　　Amphenol

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

ERL requirement for cable assemblie sthat have COM less than "4dB"

SuggestedRemedy

Change "4dB" to "TBD". Historical precedent may not be relevant for this specification

Proposed Response　　　*Response Status* **O**

Cl **179**　　*SC* **179.11.7**　　　　*P***331**　　　*L***44**　　　# 391

Kocsis, Sam　　　　　　　　　　Amphenol

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

Rd(t) = "TBD"

SuggestedRemedy

Change "TBD" to "92-ohm" to match majority of contributions to the Task Force, and better align with Zc definition in package

Proposed Response　　　*Response Status* **O**

Cl **179**　　*SC* **179.11.7**　　　　*P***331**　　　*L***45**　　　# 392

Kocsis, Sam　　　　　　　　　　Amphenol

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

RD(r) = "TBD"

SuggestedRemedy

Change "TBD" to "92-ohm" to match majority of contributions to the Task Force, and better align with Zc definition in package

Proposed Response　　　*Response Status* **O**

Cl **179A**　　*SC* **179A.7**　　　　*P***668**　　　*L***9**　　　# 393

Kocsis, Sam　　　　　　　　　　Amphenol

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

"TP0 and TP5"

SuggestedRemedy

Change to "TP0d and TP5d"

Proposed Response　　　*Response Status* **O**

Cl **179C**　　*SC* **Table 179C-4**　　　*P***682**　　　*L***38**　　　# 394

Kocsis, Sam　　　　　　　　　　Amphenol

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

"QSFP-DD800"

SuggestedRemedy

Change to "QSFP-DD1600"

Proposed Response　　　*Response Status* **O**

Cl **178**　　*SC* **178.9.1**　　　　*P***275**　　　*L***39**　　　# 395

Kocsis, Sam　　　　　　　　　　Amphenol

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

The reference impedance should match the system impedance, Rd as defined in COM spreadsheets.

SuggestedRemedy

92-ohm, TBD, or straw poll based on proposed values presented in Task Force contributions

Proposed Response　　　*Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **395**　　Page 74 of 118
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Cl **178**　　*SC* **178.10.1**　　　　*P* **285**　　　*L* **40**　　　# 396

Kocsis, Sam　　　　　　　　　　　Amphenol

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

Rd(t) = "TBD"

SuggestedRemedy

Change "TBD" to "92-ohm" to match majority of contributions to the Task Force, and better align with Zc definition in package

Proposed Response　　　*Response Status* **O**

Cl **178**　　*SC* **178.10.1**　　　　*P* **285**　　　*L* **41**　　　# 397

Kocsis, Sam　　　　　　　　　　　Amphenol

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

RD(r) = "TBD"

SuggestedRemedy

Change "TBD" to "92-ohm" to match majority of contributions to the Task Force, and better align with Zc definition in package

Proposed Response　　　*Response Status* **O**

Cl **176D**　　*SC* **176D.3.3**　　　*P* **597**　　　*L* **33**　　　# 398

Wu, Mau-Lin　　　　　　　　　　　MediaTek

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

The value of '106.255 +/- 50 ppm' is not correct.

SuggestedRemedy

Change '106.255' to '106.25'.

Proposed Response　　　*Response Status* **O**

Cl **178**　　*SC* **178.9.2**　　　　*P* **275**　　　*L* **49**　　　# 399

Li, Tobey　　　　　　　　　　　　MediaTek

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

Transmitter measurement bandwidth is TBD

SuggestedRemedy

Replace TBD with 62 GHz

Proposed Response　　　*Response Status* **O**

Cl **178**　　*SC* **178.9.3.3**　　　*P* **282**　　　*L* **16**　　　# 400

Li, Tobey　　　　　　　　　　　　MediaTek

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

COM values in Table 178–10 are TBD

SuggestedRemedy

Replace TBD with 3 dB

Proposed Response　　　*Response Status* **O**

Cl **178**　　*SC* **178.9.3.4**　　　*P* **282**　　　*L* **45**　　　# 401

Li, Tobey　　　　　　　　　　　　MediaTek

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

"The test channel COM, calculated per items 3) through 7) in 93C.2, is at least 3 dB"

The reference to the test channel COM is wrong.

SuggestedRemedy

Change it to "The test channel COM, calculated peritem e) through h) in 178.9.3.3, is at least 3 dB" to be correct

Proposed Response　　　*Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **401**　　　Page 75 of 118
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Cl **178**　　*SC* **178.10**　　　　*P* **284**　　*L* **11**　　# 402

Li, Tobey　　　　　　　　　　MediaTek

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

Minimum COM in Table 178–11 is TBD

SuggestedRemedy

Replace TBD with 3 dB in Table 178-11 and in line 28 of page 284

Proposed Response　　　*Response Status* **O**

Cl **178**　　*SC* **178.10.1**　　　*P* **285**　　*L* **38**　　# 403

Li, Tobey　　　　　　　　　　MediaTek

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

Single-ended reference resistance R0 value in Table 178-13 is TBD

SuggestedRemedy

Replace TBD with 50 Ohm

Proposed Response　　　*Response Status* **O**

Cl **178**　　*SC* **178.10.1**　　　*P* **286**　　*L* **12**　　# 404

Li, Tobey　　　　　　　　　　MediaTek

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

Receiver 3 dB bandwidth fr value in Table 178-13 is TBD

SuggestedRemedy

Replace TBD with 0.58*fb

Proposed Response　　　*Response Status* **O**

Cl **178**　　*SC* **178.10.1**　　　*P* **286**　　*L* **13**　　# 405

Li, Tobey　　　　　　　　　　MediaTek

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

The max/min values and step size of transmitter equalizer in Table 178-13 need to match those in the Table 178–6 and thost in sub-clauses 179.9.4.1.4 & 179.9.4.1.5

SuggestedRemedy

On line 14 replace TBD with -0.06:0.02:0
On line 18 replace TBD with 0:0.02:0.12
On line 22 replace TBD with -0.34:0.02:0
On line 26 replace TBD with 0.5
On line 28 replace TBD with -0.2:0.02:0

Proposed Response　　　*Response Status* **O**

Cl **178**　　*SC* **178.10.1**　　　*P* **286**　　*L* **46**　　# 406

Li, Tobey　　　　　　　　　　MediaTek

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

Transmitter differential peak output voltage in Table 178-13 is TBD

SuggestedRemedy

Replace Av with 0.413 V
Replace Afe with 0.413 V
Replace Ane with 0.608 V

Proposed Response　　　*Response Status* **O**

Cl **178**　　*SC* **178.10.1**　　　*P* **286**　　*L* **50**　　# 407

Li, Tobey　　　　　　　　　　MediaTek

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

Transmitter transition time Tr value in Table 178-13 is TBD

SuggestedRemedy

Replace TBD with Tr = 4 ps

Proposed Response　　　*Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **407**　　　Page 76 of 118
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Cl **178**   *SC* **178.10.1**   *P* **286**   *L* **53**   # 408

Li, Tobey   MediaTek

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

One sided noise spectral density in Table 178-13 is TBD

SuggestedRemedy

Replace TBD with 6e-9 V^2/GHz

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.10.1**   *P* **287**   *L* **10**   # 409

Li, Tobey   MediaTek

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

Level separation mismatch ratio RLM in Table 178-13 is TBD

SuggestedRemedy

Replace TBD with 0.95

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.9.4**   *P* **309**   *L* **23**   # 410

Li, Tobey   MediaTek

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

"4th order Bessel-Thomson filter with 3 dB bandwidth of 40 GHz" is inconsistent with
Clause 178.9.2, Annex 176D.3.3, and Annex 176E.3.3

SuggestedRemedy

Change "40 GHz" to either "TBD" or "62 GHz"

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.9.5.3**   *P* **319**   *L* **22**   # 411

Li, Tobey   MediaTek

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

COM values in Table 179–11 are TBD

SuggestedRemedy

Replace TBD with 3 dB

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.9.5.3.3**   *P* **320**   *L* **18**   # 412

Li, Tobey   MediaTek

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

4th order Bessel-Thomson filter BW is TBD

SuggestedRemedy

Replace TBD with 62 GHz

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.11**   *P* **326**   *L* **21**   # 413

Li, Tobey   MediaTek

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

Minimum COM is TBD

SuggestedRemedy

Replace TBD with 3 dB in Table 179–13 and in line 41 of page 330

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.11.7**   *P* **331**   *L* **42**   # 414

Li, Tobey   MediaTek

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

Single-ended reference resistance R0 value in Table 179–15 is TBD

SuggestedRemedy

Replace TBD with 50 Ohm

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.11.7**   *P* **332**   *L* **12**   # 415

Li, Tobey   MediaTek

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

Receiver 3 dB bandwidth fr value in Table 179–16 is TBD

SuggestedRemedy

Replace TBD with 0.58*fb

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **415**

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Cl **179**　　*SC* **179.11.7**　　　　*P* **332**　　*L* **13**　　　# 416

Li, Tobey　　　　　　　　　　　MediaTek

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

The max/min values and step size of transmitter equalizer in Table 179-16 need to match those in the Table 179–7 and thost in sub-clauses 179.9.4.1.4 & 179.9.4.1.5

SuggestedRemedy

On line 14 replace TBD with -0.06:0.02:0
On line 18 replace TBD with 0:0.02:0.12
On line 22 replace TBD with -0.34:0.02:0
On line 26 replace TBD with 0.5
On line 28 replace TBD with -0.2:0.02:0

Proposed Response　　　　*Response Status* **O**

Cl **179**　　*SC* **179.11.7**　　　　*P* **332**　　*L* **46**　　　# 417

Li, Tobey　　　　　　　　　　　MediaTek

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

Transmitter differential peak output voltage in Table 179–16 is TBD

SuggestedRemedy

Replace Av with 0.413 V
Replace Afe with 0.413 V
Replace Ane with 0.608 V

Proposed Response　　　　*Response Status* **O**

Cl **179**　　*SC* **179.11.7**　　　　*P* **332**　　*L* **50**　　　# 418

Li, Tobey　　　　　　　　　　　MediaTek

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

Transmitter transition time Tr value in Table 179–16 is TBD

SuggestedRemedy

Replace TBD with Tr = 4 ps

Proposed Response　　　　*Response Status* **O**

Cl **179**　　*SC* **179.11.7**　　　　*P* **332**　　*L* **53**　　　# 419

Li, Tobey　　　　　　　　　　　MediaTek

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

One sided noise spectral density in Table 179–16 is TBD

SuggestedRemedy

Replace TBD with 6e-9 V^2/GHz

Proposed Response　　　　*Response Status* **O**

Cl **179**　　*SC* **179.11.7**　　　　*P* **333**　　*L* **8**　　　# 420

Li, Tobey　　　　　　　　　　　MediaTek

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

Level separation mismatch ratio RLM in Table 179–16 is TBD

SuggestedRemedy

Replace TBD with 0.95

Proposed Response　　　　*Response Status* **O**

Cl **179**　　*SC* **179.11.7**　　　　*P* **333**　　*L* **9**　　　# 421

Li, Tobey　　　　　　　　　　　MediaTek

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

Number of samples per unit interval in Table 179–16 is TBD

SuggestedRemedy

Replace TBD with 32

Proposed Response　　　　*Response Status* **O**

Cl **176D**　　*SC* **176D.3.3**　　　*P* **597**　　*L* **22**　　　# 422

Li, Tobey　　　　　　　　　　　MediaTek

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

Transmitter measurement bandwidth is TBD

SuggestedRemedy

Replace TBD with 62 GHz

Proposed Response　　　　*Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **422**

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Cl **176D**　　*SC* **176D.3.3**　　　　*P***597**　　　　*L***33**　　　　# 423

Li, Tobey　　　　　　　　　　　　MediaTek

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

Signaling rate of 106.255 ± 50 ppm in Table 176D–1 is incorrect

SuggestedRemedy

Change "106.255 ± 50 ppm" to "106.25 ± 50 ppm"

Proposed Response　　　　*Response Status*　**O**

Cl **176D**　　*SC* **176D.3.4.4**　　　*P***602**　　　　*L***47**　　　　# 424

Li, Tobey　　　　　　　　　　　　MediaTek

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

Reference to ERL methodology is missing

SuggestedRemedy

Add reference to 176D.4.3.

Proposed Response　　　　*Response Status*　**O**

Cl **176D**　　*SC* **176D.3.4.4**　　　*P***603**　　　　*L***18**　　　　# 425

Li, Tobey　　　　　　　　　　　　MediaTek

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

4th order Bessel-Thomson filter BW is TBD

SuggestedRemedy

Replace TBD with 62 GHz

Proposed Response　　　　*Response Status*　**O**

Cl **176D**　　*SC* **176D.3.4.4**　　　*P***603**　　　　*L***30**　　　　# 426

Li, Tobey　　　　　　　　　　　　MediaTek

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

"Insertion loss at 26.5625 GHz"

Nyquest frqeuncy in Table 176D–4 is incorrect

SuggestedRemedy

Change "26.5625 GHz" to "53.125 GHz"

Proposed Response　　　　*Response Status*　**O**

Cl **176D**　　*SC* **176D.3.4.4**　　　*P***603**　　　　*L***34**　　　　# 427

Li, Tobey　　　　　　　　　　　　MediaTek

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

COM values in Table 176D–4 are TBD

SuggestedRemedy

Replace TBD with 3 dB

Proposed Response　　　　*Response Status*　**O**

Cl **176D**　　*SC* **176D.3.4.5**　　　*P***604**　　　　*L***1**　　　　# 428

Li, Tobey　　　　　　　　　　　　MediaTek

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

Reference to test procedure is missing

SuggestedRemedy

Add reference to 176D.3.4.4

Proposed Response　　　　*Response Status*　**O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected　　RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **428**　　　Page 79 of 118
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Cl **176D**   *SC* **176D.4**   *P* **604**   *L* **27**   # 429

Li, Tobey   MediaTek

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

Table reference is missing

SuggestedRemedy

Add reference of ERL to 176D.4.3.
Add reference of differential-mode to common-mode return loss to 176D.4.4.

Proposed Response   *Response Status*   **O**

Cl **176D**   *SC* **176D.4**   *P* **604**   *L* **24**   # 430

Li, Tobey   MediaTek

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

Minimum COM is TBD

SuggestedRemedy

Replace TBD with 3 dB in Table 176D–5 and in line 38 of page 604

Proposed Response   *Response Status*   **O**

Cl **176D**   *SC* **176D.4.1**   *P* **605**   *L* **35**   # 431

Li, Tobey   MediaTek

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

Single-ended reference resistance R0 value in Table 176D–6 is TBD

SuggestedRemedy

Replace TBD with 50 Ohm

Proposed Response   *Response Status*   **O**

Cl **176D**   *SC* **176D.4.1**   *P* **605**   *L* **50**   # 432

Li, Tobey   MediaTek

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

Receiver 3 dB bandwidth fr value in Table 176D–7 is TBD

SuggestedRemedy

Replace TBD with 0.58*fb

Proposed Response   *Response Status*   **O**

Cl **176D**   *SC* **176D.4.1**   *P* **606**   *L* **33**   # 433

Li, Tobey   MediaTek

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

Zero 2 frequency and pole 3 frequency of Continuous time filter are inconsistent with Table 178–13

SuggestedRemedy

Replace zero 2 frequency with fb/80
Change pole 3 frequency from "fb" to "fb/80"

Proposed Response   *Response Status*   **O**

Cl **176D**   *SC* **176D.4.1**   *P* **606**   *L* **40**   # 434

Li, Tobey   MediaTek

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

Transmitter differential peak output in Table 176D–7 is TBD

SuggestedRemedy

Replace Av with 0.413 V
Replace Afe with 0.413 V
Replace Ane with 0.608 V

Proposed Response   *Response Status*   **O**

Cl **176D**   *SC* **176D.4.1**   *P* **606**   *L* **49**   # 435

Li, Tobey   MediaTek

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

Transmitter transition time Tr value in Table 176D–7 is TBD

SuggestedRemedy

Replace TBD with Tr = 4 ps

Proposed Response   *Response Status*   **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **435**

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Cl **176D**   *SC* **176D.4.1**   *P* **607**   *L* **5**   # 436

Li, Tobey   MediaTek

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

Level separation mismatch ratio RLM in Table 176D–7 is TBD

SuggestedRemedy

Replace TBD with 0.95

Proposed Response   *Response Status* **O**

Cl **176D**   *SC* **176D.4.1**   *P* **607**   *L* **8**   # 437

Li, Tobey   MediaTek

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

Number of samples per unit interval in Table 176D–7 is TBD

SuggestedRemedy

Replace TBD with 32

Proposed Response   *Response Status* **O**

Cl **176E**   *SC* **176E.5.2**   *P* **633**   *L* **52**   # 438

Li, Tobey   MediaTek

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

Single-ended reference resistance R0 value in Table 176E–7 is TBD

SuggestedRemedy

Replace TBD with 50 Ohm

Proposed Response   *Response Status* **O**

Cl **176E**   *SC* **176E.5.2**   *P* **634**   *L* **6**   # 439

Li, Tobey   MediaTek

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

Receiver 3 dB bandwidth fr value in Table 176E–7 is TBD

SuggestedRemedy

Replace TBD with 0.58*fb

Proposed Response   *Response Status* **O**

Cl **176E**   *SC* **176E.5.2**   *P* **634**   *L* **34**   # 440

Li, Tobey   MediaTek

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

Pole & zero frequency values of continuous time filter are TBD

SuggestedRemedy

Replace zero 1 frequency, fz1, with fb/2.5 GHz
Replace zero 2 frequency, fz2, with fb/80 GHz
Replace pole 1 frequency, fp1, with fb/2.5 GHz
Replace pole 2 frequency, fp2, with fb GHz
Replace pole 3 frequency, fp3, with fb/80 GHz

Proposed Response   *Response Status* **O**

Cl **176E**   *SC* **176E.5.2**   *P* **634**   *L* **43**   # 441

Li, Tobey   MediaTek

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

Transmitter transition time Tr value in Table 176E–7 is TBD

SuggestedRemedy

Replace TBD with Tr = 4 ps

Proposed Response   *Response Status* **O**

Cl **176E**   *SC* **176E.5.2**   *P* **634**   *L* **53**   # 442

Li, Tobey   MediaTek

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

Level separation mismatch ratio RLM in Table 176E–7 is TBD

SuggestedRemedy

Replace TBD with 0.95

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Comment ID* **442**   Page 81 of 118
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   5/3/2024 10:09:29 AM
SORT ORDER: Comment ID

Cl **176E**　　*SC* **176E.5.2**　　　　*P* **635**　　*L* **5**　　　　# 443

Li, Tobey　　　　　　　　　　MediaTek

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

Number of samples per unit interval in Table 176E–7 is TBD

SuggestedRemedy

Replace TBD with 32

Proposed Response　　　*Response Status* **O**

Cl **176E**　　*SC* **176E.5.2**　　　　*P* **635**　　*L* **35**　　　# 444

Li, Tobey　　　　　　　　　　MediaTek

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

"Dp equal to 3" is not right as there are 3 pre-taps for the host

SuggestedRemedy

Change "Dp equal to 3" to "Dp equal to 4"

Proposed Response　　　*Response Status* **O**

Cl **116**　　*SC* **116**　　　　　*P* **92**　　*L* **40**　　　# 445

Simms, William　　　　　　　　NVIDIA

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

spacing of text on line 40 is different than spacing of the same text in lin 38

SuggestedRemedy

make spacing the same

Proposed Response　　　*Response Status* **O**

Cl **176A**　　*SC* **176A**　　　　　*P* **555**　　*L* **29**　　　# 446

Simms, William　　　　　　　　NVIDIA

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

3 states of Coefficient select echo are undefined

SuggestedRemedy

note in table 176A-3 that 010, 011, 100 are undefined/invalid

Proposed Response　　　*Response Status* **O**

Cl **176A**　　*SC* **176A.4.1+**　　　*P* **555**　　*L* **46**　　　# 447

Simms, William　　　　　　　　NVIDIA

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

Should the status field name be uniquified? The field name in the text of the table and text sections below the table do not clearly identify text as a field.

SuggestedRemedy

Change Receiver ready to RECEIVER_READY or at maybe receiver_ready and use the same in the text below the table 176A-3- Status field structure. Pertains to all field names.

Proposed Response　　　*Response Status* **O**

Cl **176A**　　*SC* **176A.6.4**　　　*P* **558**　　*L* **54**　　　# 448

Simms, William　　　　　　　　NVIDIA

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

It took me longer than usual to realize the algorithm continues on page 559

SuggestedRemedy

Maybe put a '---continued---' at the last line of page 558. Disregard if this is inconsistent with IEEE style

Proposed Response　　　*Response Status* **O**

Cl **176A**　　*SC* **176A-6**　　　　*P* **568**　　*L* **21**　　　# 449

Simms, William　　　　　　　　NVIDIA

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

Figure 176A-6 has an extraneous < in the name 'local_tf_lock<*'

SuggestedRemedy

change to 'local_tf_lock*'

Proposed Response　　　*Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected　　RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **449**　　　　Page 82 of 118
5/3/2024 10:09:29 AM

Cl **176D**   *SC* **176D.3.3**   *P* **598**   *L* **16**   # 450

Simms, William   NVIDIA

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

Where does the value for SNDR of 32.5dB come from?

SuggestedRemedy

No change suggested, looking for source material

Proposed Response   *Response Status* **O**

Cl **176D**   *SC* **176D.3.4.4**   *P* **603**   *L* **31**   # 451

Simms, William   NVIDIA

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

Moot point maybe given table is all TBD, but the frequency should be 53.125GHz

SuggestedRemedy

change to 53.125GHz

Proposed Response   *Response Status* **O**

Cl **178**   *SC* **178.9.2**   *P* **276**   *L* **18**   # 452

Simms, William   NVIDIA

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

SCMR may need to be relaxed for 200Gb/s. Measure of 15dB full band at TP0v given full band Vcm noise of 80mVpp at TP2.

SuggestedRemedy

Likely need to tighten 80mV Vcm in table 179-7 for 200Gb/s

Proposed Response   *Response Status* **O**

Cl **175**   *SC* **175.2.4.6**   *P* **175**   *L* **22**   # 453

Opsasnick, Eugene   Broadcom

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

Sub-clause 172.2.4.6 has a reference to a text file containing the 800GBASE-R alignment marker values. CL 175 should add a similar note with a corresponding text file for the 1.6TBASE-R alignment markers.

SuggestedRemedy

Add text near line 22: "NOTE—A text file containing the alignment marker patterns, as shown in Table 175–1 is available at https://standards.ieee.org/downloads/802.3/."

A presentation will be submitted with a corresponding text file containing the 1.6TBASE-R AM values.

Proposed Response   *Response Status* **O**

Cl **175**   *SC* **175.2.4.5**   *P* **174**   *L* **3**   # 454

Opsasnick, Eugene   Broadcom

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

The Editor's note at the end of subclause 175.2.4.5 "Scrambler" states that there are no requirements or restrictions in the 1.6TE PCS baselines for the scrambler seeds for each flow. The note also mentions that the corresponding sub-clause in 802.3df for 800GE PCS states that the two flows would have identical outputs if the seeds are identical and the data input is identical (such as after reset). The 1.6TE PCS does not have two separate sets of PCSLs like 800GE PCS, but the PCSL formation could have back-to-back repeating RS-symbol values if identical seeds are used. Suggest to require different seeds after reset in the scramblers of each flow as written in the paragraph above the editor's note.

SuggestedRemedy

Remove the editor's note at the top of page 174, and leave the wording in 175.2.4.5 as-is with the requirement that the two scramblers are initialized with different seeds.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Comment ID* **454**   Page 83 of 118
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   5/3/2024 10:09:29 AM
SORT ORDER: Comment ID

Cl **175A**   *SC* **175A**   *P* **539**   *L* **8**   # 455

Opsasnick, Eugene   Broadcom

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

Annex 175A contains tabular data for an example created by the 1.6TBASE-R PCS TX functions, including the scrambler output, RS-FEC codeword generation, and PCS lane interleaving. The editor's note on page 539 has a placeholder for a link to a text file that has the machine readable text data. That data file needs to be created.

SuggestedRemedy

A presentation is planned to submit a data file which corresponds to the Annex 176A example and can be referenced in the editor's note

Proposed Response   *Response Status* **O**

Cl **90A**   *SC* **90A**   *P* **519**   *L* **43**   # 456

Opsasnick, Eugene   Broadcom

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

In table 90A-1, the column titled "Alignment marker/ codeword marker insertion/removal" has a value of 2.56ns for 1.6T in the last row. This value should be the xMII time (at MAC data rate) of one Alignment marker block. The 1.6TE PCS lanes are now running at 100G vs 25G for slower speeds, so this number does not scale directly from the other entries. The value for the 1.6T row should be 1.28ns (a full AM group = 8 256b/257b blocks, so the MII time = 8 * 256 / 1600 = 1.28ns). Note that this column has correct values for 25G, 40G, 50G, and 100G. However, the value listed for 200G, 400G and 800G of 2.56ns should be 5.12ns and should also be fixed in maintenance.

SuggestedRemedy

Change the accuracy impairment value of 2.56 ns to 1.28 ns for the 1.6T Ethernet rate in Table 90A-1.

Proposed Response   *Response Status* **O**

Cl **176A**   *SC* **176A.6.4**   *P* **558**   *L* **17**   # 457

Opsasnick, Eugene   Broadcom

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

This the entire block of pseudo-code in this subclause is exactly the same as the code in subclause 136.8.11.4.4, and the entire subcluse only differs by adding one coefficient (-3) to the k_list. I suggest replacing the text of the entire subclause with a refernece to subclause 136.8.11.4.4.

SuggestedRemedy

New text for this subclause:
"The handling of incoming requests is specified by the coefficient update state diagram (Figure 136-9).

The behavior of the UPDATE_C(k) function shall be consistent with the algorithm specified in 136.8.11.4.4 with one execption:
    - The set of of valid equalizer coefficient indices, k_list, is expanded by one from {-2, -1, 0, 1} to {-3, -2, -1, 0 ,1}.

Proposed Response   *Response Status* **O**

Cl **176A**   *SC* **176A.10.4**   *P* **566**   *L* **46**   # 458

Opsasnick, Eugene   Broadcom

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

The state diagram shown in Figure176A-8 "Training frame lock state diagram" on page 570 and Figure 176A-9 "Coefficient update state diagram" are exactly the same as the state diagrams of the same names in Figure 136-8 and Figure 136-9. Only the reset signal is renamed from "mr_restart_training" to "mr_restart".

SuggestedRemedy

Remove Figure 176A-8 and Figure 176A-9.

Change "mr_restart" to "mr_restart_trainging" in subclause 176A.10.2.1 on page 564, line 21.

Change the text at the bottom of page 566 to refer to the equivilent state diagrams in clause 136 instead of the removed figures (with editorial license).

Any variables defined in subclause 176A.10.3.1 which are only used in the removed state diagrams can also be removed.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
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Comment ID **458**

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Cl **176**   *SC* **176.7.1.2.2**   *P***223**   *L***39**   # 459

Opsasnick, Eugene   Broadcom

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

In Figure 176-16 and Figure 176-17, on the following page, the symbol pattern of the even PCSLs in the upper half (PCSL 16-31) is not shown. It would be easier to see the RS symbol patterns if the figures included at least one even PCSL in the range of 16-31.

SuggestedRemedy

These two figures show PCSLs for lanes 0,1, and 31. Suggest to show the PCSL sybol pattern for lanes 0,1,…15, 16, 17,…31.

Proposed Response   *Response Status* **O**

Cl **73**   *SC* **73**   *P***83**   *L***1**   # 460

Slavick, Jeff   Broadcom

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

We are now using a Next Page to advertise IEEE defined PHYs.   However the order of when Next Pages are introduced, defined and then used is a bit out of order.   So re-arranging the order in which AN is specified would help readers to better understand what how Next Pages are defined, how to use them and when to use them.

SuggestedRemedy

Presentation will be provided.

Proposed Response   *Response Status* **O**

Cl **170**   *SC* **170.1**   *P***135**   *L***12**   # 461

Slavick, Jeff   Broadcom

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

The title of Clause 173 does include BM.

SuggestedRemedy

Remove the BM- from Table 171-1 for the Clause 173 entry and footnote A

Proposed Response   *Response Status* **O**

Cl **171**   *SC* **171.8**   *P***145**   *L***6**   # 462

Slavick, Jeff   Broadcom

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

The MDIO mapping table is different from Clause 175, it should use the new form that Clause 175 is using.

SuggestedRemedy

Have Tables 171-5a through 171-5d use the same format as Clause 175

Proposed Response   *Response Status* **O**

Cl **175**   *SC* **175.2.4.4**   *P***173**   *L***41**   # 463

Slavick, Jeff   Broadcom

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

The last sentence is giving the tranccoded blocks sent to each flow a name. So it's not really make a flow of blocks. If anything it's making a series or stream of blocks.

SuggestedRemedy

Change the last sentence to read: "The transcoded blocks sent to flow 0 are referred to as tx_xcoded_f0<256:0> and the ones sent to flow 1 as tx_xcoded_f1<256:0>."

Proposed Response   *Response Status* **O**

Cl **175**   *SC* **175.2.4.6**   *P***174**   *L***42**   # 464

Slavick, Jeff   Broadcom

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

tx_am_sf doesn't allow but provides a way to communicate the mandatory degrade status.

SuggestedRemedy

Change "allows the local PCS to communicate the status of the FEC degraded feature to the remote PCS" to "communicates the local PCS FEC degraded status to the remote PCS".

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **464**

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Cl **175**　　*SC* **175.2.4.6**　　　　　*P* **176**　　*L* **5**　　　# 465

Slavick, Jeff　　　　　　　　　　　　Broadcom

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

am_mapped_f0 and am_mapped_f1 aren't solely based on the 10b-distribution and we never talk about how this two variables are us splitting the alingment marker group up.

SuggestedRemedy

Change:
"The variables am_mapped_f0 and am_mapped_f1 are then derived from 10-bit interleaving the group of 16 alignment markers, am_x, using the following procedure"
To:
"The alignment marker group is mapped into variables am_mapped_f0 and am_mapped_f1 as follows. First a 10-bit interleaving the group of 16 alignment markers, am_x, is done using the following procedure "

Proposed Response　　　　*Response Status*　**O**

Cl **175**　　*SC* **175.2.4.6**　　　　　*P* **176**　　*L* **25**　　　# 466

Slavick, Jeff　　　　　　　　　　　　Broadcom

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

am_mapped_f0 and am_mapped_f1 contain data that is sent into flow 0/1 and through codewords AB and CD.

SuggestedRemedy

Change:
"Note that am_mapped_f0 contains the 10-bit symbols of FEC codewords A and B, and am_mapped_f1 contains the 10-bit symbols of FEC codewords C and D. "
To:
"Note that am_mapped_f0 is sent to flow 0 which produces FEC codewords A and B, and am_mapped_f1 is sent to flow 1 which produces FEC codewords C and D."

Proposed Response　　　　*Response Status*　**O**

Cl **175**　　*SC* **175.2.4.6.2**　　　　*P* **177**　　*L* **6**　　　# 467

Slavick, Jeff　　　　　　　　　　　　Broadcom

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

Add a intro to what tx_scrambled is.

SuggestedRemedy

Change:
"The variables tx_scrambled_am_f0<10279:0> and tx_scrambled_am_f1<10279:0> are constructed in one of two ways."
To:
"In each flow a 10280-bit block of data is formed with two FEC codewords worth of message data,   tx_scrambled_am_f0<10279:0> in flow 0 and tx_scrambled_am_f1<10279:0> in flow 1 and they are constructed in one of two ways. "

Proposed Response　　　　*Response Status*　**O**

Cl **175**　　*SC* **175.2.5.3**　　　　　*P* **181**　　*L* **40**　　　# 468

Slavick, Jeff　　　　　　　　　　　　Broadcom

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

The counters for correctd, uncorrected and error have always been mandatory, while the cw counter and bin counters have been optional. So Should is not appropiate.

SuggestedRemedy

Change:
"The following counters should be implemented to aid a network operator in determining the link quality. "
To:
"The PCS provides the following counters that track FEC decoder statistics."

Proposed Response　　　　*Response Status*　**O**

Cl **175**　　*SC* **175.2.5.3**　　　　　*P* **182**　　*L* **9**　　　# 469

Slavick, Jeff　　　　　　　　　　　　Broadcom

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

The Note about tracking statistics across all 4 decoders is missing from the bin counter.

SuggestedRemedy

Add this to the definition of the FEC_codeword_error_bin_i
"Note that this counter tracks codewords with errors across all four codewords."

Proposed Response　　　　*Response Status*　**O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected　　RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **469**

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Cl **119**　　*SC* **119.2.5.8**　　　　　*P***112**　　　　*L***27**　　　　# 470

Slavick, Jeff　　　　　　　　　　　Broadcom

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

Extranious "either"

SuggestedRemedy

remove the word "either"

Proposed Response　　　*Response Status*　**O**

Cl **176**　　*SC* **176.2**　　　　　　*P***196**　　　　*L***46**　　　　# 471

Slavick, Jeff　　　　　　　　　　　Broadcom

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

Is respectively necessary here? X is just a list of different rates.

SuggestedRemedy

remoe the ", repsectively,"

Proposed Response　　　*Response Status*　**O**

Cl **176**　　*SC* **176.2**　　　　　　*P***196**　　　　*L***53**　　　　# 472

Slavick, Jeff　　　　　　　　　　　Broadcom

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

Is respectively necessary here? X is just a list of different rates.

SuggestedRemedy

remoe the ", repsectively"

Proposed Response　　　*Response Status*　**O**

Cl **176**　　*SC* **176.2**　　　　　　*P***197**　　　　*L***3**　　　　# 473

Slavick, Jeff　　　　　　　　　　　Broadcom

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

Is respectively necessary here? X is just a list of different rates.

SuggestedRemedy

remoe the ", repsectively"

Proposed Response　　　*Response Status*　**O**

Cl **176**　　*SC* **176.5.1.6.4**　　　*P***206**　　　　*L***38**　　　　# 474

Slavick, Jeff　　　　　　　　　　　Broadcom

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

Figure 119-12 uses functions and variables defined in CL119 but those aren't called out to be used, just that restart_lock_mux is used to replace restart_lock

SuggestedRemedy

add "using the state variables defined in 119.2.6.2" after Table 119-1 with edtiorial license

Proposed Response　　　*Response Status*　**O**

Cl **175**　　*SC* **175.5.1.3.1**　　　*P***201**　　　　*L***29**　　　　# 475

Slavick, Jeff　　　　　　　　　　　Broadcom

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

There is more details to the AM lock function add a reference

SuggestedRemedy

add a "(see 175.5.1.6.4)" after Table 119-1

Proposed Response　　　*Response Status*　**O**

Cl **176**　　*SC* **176.5.1.3.5**　　　*P***203**　　　　*L***25**　　　　# 476

Slavick, Jeff　　　　　　　　　　　Broadcom

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

It's a multiplexor or a multiplexing function

SuggestedRemedy

add the word function after multiplexing

Proposed Response　　　*Response Status*　**O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general　　　　　*Comment ID* **476**　　　Page 87 of 118
COMMENT STATUS: D/dispatched A/accepted R/rejected　　RESPONSE STATUS: O/open W/written C/closed Z/withdrawn　　　　　5/3/2024 10:09:29 AM
SORT ORDER: Comment ID

Cl **176**   *SC* **176.5.1.6.5**   *P* **206**   *L* **48**   # 477

Slavick, Jeff   Broadcom

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

Figure 119-12 uses functions and variables defined in CL119 but those aren't called out to be used, just that restart_lock_mux is used to replace restart_lock

SuggestedRemedy

add "using the state variables defined in 119.2.6.2" after Table 119-1 with edtiorial license

Proposed Response   *Response Status* **O**

Cl **176**   *SC* **176.5.1.1**   *P* **200**   *L* **35**   # 478

Slavick, Jeff   Broadcom

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

test pattern generate is overlapping with the IS_SIGNAL_requst line in Figure 176-2

SuggestedRemedy

Move "test pattern genrate" to not overlap with the inst.IS_SIGNAL.request line
Same in Figure 176-9,10,13,14,15,19,20,24,25,26

Proposed Response   *Response Status* **O**

Cl **176**   *SC* **176.5.1.1**   *P* **200**   *L* **35**   # 479

Slavick, Jeff   Broadcom

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

test pattern generate is overlapping with the IS_SIGNAL_requst line in Figure 176-2

SuggestedRemedy

Move "test pattern genrate" to not overlap with the inst.IS_SIGNAL.request/indication line
Same in Figure 176-9,10,13,14,15,19,20,24,25,26

Proposed Response   *Response Status* **O**

Cl **176**   *SC* **176.8.1.1**   *P* **231**   *L* **14**   # 480

Slavick, Jeff   Broadcom

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

test pattern check is overalpping with IS_SIGNAL.request

SuggestedRemedy

Move "test pattern check" to no overlap withPMA.IS_SIGNAL.request in Figure 176-21

Proposed Response   *Response Status* **O**

Cl **175**   *SC* **175.2.4.2**   *P* **173**   *L* **26**   # 481

Slavick, Jeff   Broadcom

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

A note that modifying the data stream could affect TimeSync would be useful.

SuggestedRemedy

Add the following note:
"NOTE -- Insertion or removal of characters may affect protocols like times synchronization (see 90.4.1.2)"

Proposed Response   *Response Status* **O**

Cl **176**   *SC* **176.5.1.6.5**   *P* **208**   *L* **11**   # 482

Slavick, Jeff   Broadcom

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

Counter _done needs to be at the end of the counter name.

SuggestedRemedy

Change symbol_pair_lock_counter_done_demux to symbol_pair+lock_counter_demux_done

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **482**

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Cl **176**   *SC* **176.5.1.6.5**   *P* **208**   *L* **9**   # 483

Slavick, Jeff   Broadcom

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

I think it's best if the Start of the counter is the last thing in the Box

SuggestedRemedy

Move "Start symbol_pair_lock_counter_demux" to be the last thing in LOSS_OF_SYMBOL_PAIR_LOCK box

Proposed Response   *Response Status*   **O**

Cl **176**   *SC* **176.5.1.5**   *P* **205**   *L* **20**   # 484

Slavick, Jeff   Broadcom

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

Detailed functions and state diagrams has no content

SuggestedRemedy

Change 176.5.1.6 to be a sub-heading of 176.5.1.5 (4th tier I think).

Proposed Response   *Response Status*   **O**

Cl **176**   *SC* **176.5.1.6.1**   *P* **205**   *L* **31**   # 485

Slavick, Jeff   Broadcom

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

The Variables state that these all of them, not inheriting Cl119 functions except for some replacements.

SuggestedRemedy

Copy Figure 119-12 into Cl 176 and modify it to use:
restart_lock_dir **with dir in italics **
amps_lock_dir ** with dir in italics **
pcs_lane_mapping_dir ** with dir in italics **
add a NOTE that italics dir is either mux or demux

In Variables, Constants and Counters sections define everything that is used, referring to Cl 119 when possible.

Change referenes to Figure 119-12 to point to the new figure.

With editorila license

Proposed Response   *Response Status*   **O**

Cl **176**   *SC* **176.6.1.2.1**   *P* **215**   *L* **22**   # 486

Slavick, Jeff   Broadcom

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

The deskew process doesn't need an exception since the referred texts says to do it across "ALL" PCSLs

SuggestedRemedy

Remove the deskew across 16 lanes exception in 176.6.1.2.1
Remove the deskew across 32 lanes exception in 176.7.1.2.1

Proposed Response   *Response Status*   **O**

Cl **176**   *SC* **176.5.1.6.1**   *P* **208**   *L* **14**   # 487

Slavick, Jeff   Broadcom

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

To support 400G also using the same state machines we need to make Figure 176-8 and the definition of symbol_pair_lock_demux have a <y> in it.

SuggestedRemedy

Add a <y> to symbol_pair_lock_demux defintion and in Figure 176-8.   Upate the definition in 176.5.1.6.1 for symbol_pair_lock_demux<y> to have a range of of y=0

Proposed Response   *Response Status*   **O**

Cl **177**   *SC* **177.4.1**   *P* **252**   *L* **19**   # 488

Slavick, Jeff   Broadcom

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

The delay line for Cl177 starts with feeding data into the longest delay line while Cl184 sends it to the delay line with the shortest delay.

SuggestedRemedy

Change Cl177 to have the Delay Line 0 be the minimal delay and the Delay Line 2 to be the longest delay.

Proposed Response   *Response Status*   **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **488**

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Cl **177**   *SC* **177.4.6**   *P* **254**   *L* **44**   # 489

Slavick, Jeff   Broadcom

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

The last paragraph describing options for how the pad insertion could be done is unnecessary. The requirement that it ocurs every 8704 CW and follows the Figure 177-6 is sufficient.

SuggestedRemedy

Remove the last paragraph of 177.4.6

Proposed Response   *Response Status* **O**

Cl **177**   *SC* **177.5.1**   *P* **256**   *L* **50**   # 490

Slavick, Jeff   Broadcom

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

Monitor and drop says you monitor on all flows. But Figure 177-7 is a per flow state diagram. So is each Flow checking for 140 bad out of 150? And 150 is not a multiple of 8 for it to span across all flows evenly.

SuggestedRemedy

Change:
"keeps monitoring 150 consecutive codewords on all flows, if at least 140 codewords are invalid, drop sync and restart from step a). "
To:
"each flow counts the number of invalid codewords seen in consecutive non-overlapping 150 codeword windows, if at least 140 codewords are invalid, drop sync and restart from step a). "

Proposed Response   *Response Status* **O**

Cl **177**   *SC* **177.6.3**   *P* **262**   *L* **8**   # 491

Slavick, Jeff   Broadcom

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

In Figure 177-8 the wrong character is showing up for the <= symbol

SuggestedRemedy

Fix <= symbol in Figure 177-8

Proposed Response   *Response Status* **O**

Cl **177**   *SC* **177.6.2.1**   *P* **258**   *L* **52**   # 492

Slavick, Jeff   Broadcom

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

Countes automagically have a _done variable created for them, so no need to define fc_cnt_done

SuggestedRemedy

Remove fc_cnt_done definition

Proposed Response   *Response Status* **O**

Cl **177**   *SC* **177.5.3.1**   *P* **257**   *L* **45**   # 493

Slavick, Jeff   Broadcom

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

Defining how a miscrorected codeword can occur could be phrased more clearly.

SuggestedRemedy

Change:
"Note that for soft-decision decoded Inner FEC codewords, when there is more than one bit error in a codeword, there is always a non-zero chance that miscorrection could happen."
To:
"Note that when there is more than one bit error in a codeword there is a chance that the soft decision decoder could miscorrect the codeword."

Proposed Response   *Response Status* **O**

Cl **176A**   *SC* **176A.2.3.2**   *P* **552**   *L* **26**   # 494

Slavick, Jeff   Broadcom

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

The PRBS gen should "stop" if trainng stops.

SuggestedRemedy

Add "while training is in progress while this mode is selected" after "is not stopped or reset".

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **494**

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Cl **176A**   *SC* **176A.2.3.3**   *P* **552**   *L* **43**   # 495

Slavick, Jeff   Broadcom

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

The PRBS gen should "stop" if trainng stops.

SuggestedRemedy

Add "while training is in progress while this mode is selected" after "is not stopped or reset".

Proposed Response   *Response Status* **O**

Cl **176A**   *SC* **176A.2.3.3**   *P* **552**   *L* **41**   # 496

Slavick, Jeff   Broadcom

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

PRBS13 free-running can only provide PAM4 it does not have a select for PAM2 or PAM4 with precode while PRBS31 does have those options. So how can we refer to PRBS13 free running for how to map the PRBS data to training pattern.

SuggestedRemedy

Split the 2nd paragraph of 176A.2.3.3 into 3 paragraphs tha defines how the pattern for each of the the possible encoding options as is done in 176A.2.3.1

Proposed Response   *Response Status* **O**

Cl **176A**   *SC* **176A.2.3.2**   *P* **552**   *L* **31**   # 497

Slavick, Jeff   Broadcom

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

There is only 1 mode of operation for PRBS13 free-running, PAM4. We do have 1 free mode.

SuggestedRemedy

Add PRBS13-free running with precode as an option for a training pattern.

Proposed Response   *Response Status* **O**

Cl **176A**   *SC* **176A.2.3.3**   *P* **552**   *L* **46**   # 498

Slavick, Jeff   Broadcom

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

There is no zero pad for PRBS31 free-running. This means we could have a run length of 31 3's in a row when the maximal run length of the PRBS pattern runs into Frame Marker. The Zero pad is really part of the Framer Marker ensuring there is a distinct edge ahead of 16 UI run 3's for the start of the frame marker.

SuggestedRemedy

Bring the zero-pad back into the definition of the training frame. Stating that it is immediately precedes the training frame marker to provide a disticnt transition from training pattern to frame marker of the next training frame.

Proposed Response   *Response Status* **O**

Cl **176A**   *SC* **176A.3.1**   *P* **553**   *L* **45**   # 499

Slavick, Jeff   Broadcom

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

Remove the specifity of how many presets there are.

SuggestedRemedy

Change:
"The initial condition request bits are used to select one of the five predefined transmitter equalizer configurations (presets) specified in the AUI or PMD clauses. "
To:
"The initial condition request bits are used to select a predefined transmitter equalizer configurations (presets) specified in the AUI or PMD clauses. "

Proposed Response   *Response Status* **O**

Cl **176A**   *SC* **176A.6.2**   *P* **557**   *L* **53**   # 500

Slavick, Jeff   Broadcom

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

To support AUI or PMDs only providing a subset of the availabile PRESETs we should define a behavior in that scenario

SuggestedRemedy

Add a statement that if the AUI or PMD does not specify coefficient values for a given preset setting then no change is made to the existings settings and ic_sts response of updated is provided.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

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Cl **176A**   *SC* **176A.4**   *P* **555**   *L* **27**   # 501

Slavick, Jeff   Broadcom

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

You have self generated data you're sending but you don't have your self setup to send mission data yet.

SuggestedRemedy

Remove the "No data is available," from the option 1 of Extend training bit

Proposed Response   *Response Status* **O**

Cl **183**   *SC* **183.6.3**   *P* **428**   *L* **51**   # 502

Rodes, Roberto   Coherent

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

Adding explanation on allocation for penalties calculation.

SuggestedRemedy

Use same approach than for the inserion loss adding a note in the LR4 value with the text:"Allocation for penalties is calculated using an additional penalty of 0.7dB from DGD, and 0.4dB from MPI"

Proposed Response   *Response Status* **O**

Cl **183**   *SC* **183.6.1**   *P* **425**   *L* **27**   # 503

Rodes, Roberto   Coherent

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

Change spec format consistent with FR4

SuggestedRemedy

Replace 0.5+TDECQ by 0.5+Max(TECQ,TDECQ)

Proposed Response   *Response Status* **O**

Cl **176D**   *SC* **176D.4.1**   *P* **605**   *L* **35**   # 504

Howard Heck   Intel Corporation

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

We need to fill in values for the TBDs AUI C2C device & package parameters in Table 176D-6and COM parameters in Table 176D-7.

SuggestedRemedy

Adopt the values proposed below for AUI C2C:
Table 176D-6:
R_0 = 50 ohms, R_d, = 50 ohms,
Table 176D-7:
f__r,= 0.75* f_b , A_v = 0.413 V, A_fe = 0.413 V, A_ne = 0.608 V, SNR_Tx = 33 dB, A_dd 0.02,R_LM = 0.95, eta_0 = 1.25e-8 V^2/GHz, M = 32,
d_w = 4, N_fix = 28, N_g = 0, N_f = NA, N_max = NA,, sigma_RJ = 0.01.
j W_min(j) W_max(j)
-4 0 0.5
-3 -0.15 0
-2 0 0.4
-1 -0.7 0
1 -0.35 0.85
2 -0.8
0.6
3-4 -0.2 0.3
5-8 -0.15 0.15
9-28 -0.05 0.05
A presentation is planned for the May 2024 interim in which we will provide analysis to supportthe proposed values.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **504**

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Cl **177**   *SC* **177.6**   *P* **262**   *L* **5**   # 505

Ren, Hao   Huawei

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

In Figure 177–8, the input variable of state FS_LOCK_INIT is not correct. It would cause a FS lock error.

SuggestedRemedy

FS_LOCK_INIT state should be entered after all the 8 flows obtain their inner FEC codeword boundaries and inner FEC flow 0 is identified, when fs_lock is false.

Propose change:
Change the input variable from ' !all_synced ' to ' all_synced * !fs_lock '.

Change the definition of all_synced
from
'A Boolean variable that is set to true when sync_flow<x> is true for all eight flows and is set to false when sync_flow<x> is false for any x.'
to
'A Boolean variable that is set to true when inner FEC flow 0 is identified and is set to false when sync_flow<x> is false for any x.'
(in page 258 line 48-50)

Proposed Response   *Response Status* **O**

Cl **1**   *SC* **1.3**   *P* **46**   *L* **33**   # 506

Dawe, Piers   Nvidia

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

Add and update connector references as necessary. This is what is in 1.3:
SFF-8402, Rev 1.1, September 13, 2014, Specification for SFP+ 1X 28 Gb/s Pluggable Transceiver Solution (SFP28).
SFF-8432, Rev 5.1, August 8, 2012, Specification for SFP+ Module and Cage.
SFF-8436, Rev 4.8, October 31, 2013, Specification for QSFP+ 10 Gb/s 4X Pluggable Transceiver.
SFF-8665, Rev 1.9, June 29, 2015, Specification for QSFP+ 28 Gb/s 4X Pluggable Transceiver Solution (QSFP28).

SuggestedRemedy

Use these for now (most will be updated before this project is done):
OSFP Octal Small Form Factor Pluggable Module, Rev 5.0, October 2, 2022
QSFP-DD/QSFP-DD800/QSFP-DD1600 Hardware Specification for QSFP Double Density 8x Pluggable Transceivers, Rev 7.0, September 29, 2023
SFF-8665 Rev 1.9.4, 2022-04-01, QSFP+ 4X Pluggable Transceiver Solutions
SFF-TA-1011 Rev 1.1, 2024-04-19, Cross Reference to Select SFF Connectors and Modules
SFF-TA-1027, Rev 1.0, 2024-04-16, QSFP2 Connector, Cage, & Module Specification
SFF-TA-1031, Rev 1.0, 2023-06-11, SFP2 Cage, Connector, & Module Specification
https://osfpmsa.org/specification.html
http://www.qsfp-dd.com/specification/
Refer to these documents from 179C.

Proposed Response   *Response Status* **O**

Cl **45**   *SC* **45.2.1.60b**   *P* **65**   *L* **17**   # 507

Dawe, Piers   Nvidia

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

Shouldn't LR4 come before LR1 (same reach, narrower) and the order goes up the page, counting the bits forward

SuggestedRemedy

Swap 800GBASE-LR4 and 800GBASE-LR1

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **507**

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Cl **45**   *SC* **45.2.1.60b**   *P* **65**   *L* **24**   # 508

Dawe, Piers   Nvidia

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

800GBASE-DR4-2 has longer reach than 800GBASE-FR4-500

SuggestedRemedy

Swap them

Proposed Response   *Response Status* **O**

Cl **45**   *SC* **45.2.1.60c**   *P* **67**   *L* **21**   # 509

Dawe, Piers   Nvidia

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

It's unfortunate that 800GBASE-ER1 and 800GBASE-ER1-20 are in different registers, and 800GBASE-ER1-20, having less reach, should come first

SuggestedRemedy

Move 800GBASE-ER1 from 1.73.14 to 1.74.0. 1.73.14 goes back to reserved - maybe it can be used for 800GBASE-LR20-1 ;)

Proposed Response   *Response Status* **O**

Cl **116**   *SC* **116.5**   *P* **107**   *L* **46**   # 510

Dawe, Piers   Nvidia

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

A new footnote has appeared "At the PCS receive input, 1 UI is equivalent to 1 bit." attached to an unchanged number. There is no equivalent footnote for Table 116-8. In 802.3, "bit" means MAC bit. I don't know what point the footnote is making - that PCS lanes use binary signalling not PAM4? Nor why it is here. If it were kept, it should say "1 bit on a PCS lane" or similar.

SuggestedRemedy

Delete footnote f

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.9.4**   *P* **309**   *L* **44**   # 511

Dawe, Piers   Nvidia

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

AC common-mode voltages are not as large as this in practice, even at 200G/lane

SuggestedRemedy

Reduce both AC common-mode voltage limits for CR, KR, C2C and C2M.

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.9.4**   *P* **309**   *L* **46**   # 512

Dawe, Piers   Nvidia

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

Supply voltages and voltage swing trend downwards over the years. This 1200 mV max has not changed since 10GBASE-KR, a long time ago. C2M has 750 mV.

SuggestedRemedy

Reduce 1200 mV to e.g. 1000 mV, here, in the receiver Table 179-10 and in the text in 179.9.5.2. Reduce the steady-state voltage vf max from 0.6 V to 0.5 V. Similarly for KR and C2C.

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.9.4**   *P* **310**   *L* **27**   # 513

Dawe, Piers   Nvidia

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

Our way of measuring jitter doesn't work well enough with the increased max host loss over 3ck. It is not clear that it can or should be fixed. Our way of defining SNDR doesn't work correctly over host loss either. This can be fixed, but "vertical and horizontal noise" act together to degrade BER: more of one goes with less of the other.

SuggestedRemedy

Delete the SNDR and jitter specs. Add a VEC-like, TDECQ-like spec using this clause's COM reference receiver which can be implemented in a scope. Similarly for KR and C2C.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **513**

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Cl **179**   *SC* **179.9.4.6**   *P* **315**   *L* **15**   # 514

Dawe, Piers   Nvidia

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

As explained in other comments, up to 3ck the SNDR spec acted together with the jitter spec to protect the link performance - but we don't have a satisfactory way of measuring jitter at today's speeds and losses, and separating the two things out "leaves margin on the table".

SuggestedRemedy

Delete the SNDR section. Add a VEC-like, TDECQ-like spec using this clause's COM reference receiver which can be implemented in a scope. Similarly for KR and C2C.

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.9.4.7**   *P* **315**   *L* **24**   # 515

Dawe, Piers   Nvidia

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

Measuring jitter separately to other impairments relies on a better slew rate to noise ratio than we have at the observation point, and better than what is needed to make good links.

SuggestedRemedy

Delete the jitter section. Add a VEC-like, TDECQ-like spec using this clause's COM reference receiver which can be implemented in a scope. Similarly for KR and C2C.

Proposed Response   *Response Status* **O**

Cl **179**   *SC* **179.11.1**   *P* **326**   *L* **27**   # 516

Dawe, Piers   Nvidia

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

"Nominal impedance" is something for a datasheet not a spec. If someone wants to build a cable assembly with 95 ohm bulk cable and it passes the spec - that's OK.

SuggestedRemedy

Delete "The nominal differential characteristic impedance of the cable assembly is 100 [ohm]". Move the one remaining sentence into 179.11.

Proposed Response   *Response Status* **O**

Cl **180**   *SC* **180.6.2**   *P* **354**   *L* **35**   # 517

Dawe, Piers   Nvidia

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

In 802.3db we acknowledged that single-lane PMDs are often packaged in multilane modules, and subject to much the same crosstalk as multilane PMDs.

SuggestedRemedy

Delete footnote e, "No aggressors needed for 200GBASE-DR1." In 180.8.13 Stressed receiver sensitivity, add "For a receiver in a multilane device, the OMA outer of the aggressor lanes is specified in Table 180-8."

Proposed Response   *Response Status* **O**

Cl **180**   *SC* **180.8.11**   *P* **365**   *L* **51**   # 518

Dawe, Piers   Nvidia

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

"The upper -3 dB limit of the measurement apparatus is to be approximately equal to the signaling rate": I believe this dates back at least to the first Fibre Channel, ~1 Gb/s, long before adaptive equalisers that optimise the receiver bandwidth. We have a RIN spec to help the accuracy of the TDECQ spec, which is the actual assessment of signal quality. Gigabit Ethernet now uses 937.5 MHz, 75% of the signalling rate. Measuring a peaky noise spectrum in too much bandwidth gives a flattering average, which is not what we want.

SuggestedRemedy

Change the bandwidth for RIN measurement to be the same as the TDECQ receiver's BT4 filter (50% of signalling rate ~ 53.1 GHz) or 75%, or something in between.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **518**
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Cl **180**　　*SC* **180.8.13**　　　　*P* **366**　　　*L* **25**　　　　# 519

Dawe, Piers　　　　　　　　　　　　　Nvidia

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

More exceptions - I found these in 167.8.14

SuggestedRemedy

The applied sinusoidal jitter is specified in 180.8.13.1.
The values of overshoot/undershoot and transmitter power excursion of the stressed receiver conformance signal are within the limits specified in Table 180-7.
For a receiver in a multilane device, the OMA outer of the aggressor lanes is specified in Table 180-8.

Add a sinusoidal jitter section following 167.8.14.1 (but see next comment).

Proposed Response　　　　*Response Status*　**O**

Cl **180**　　*SC* **180.8.13**　　　　*P* **366**　　　*L* **26**　　　　# 520

Dawe, Piers　　　　　　　　　　　　　Nvidia

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

If the rising LF jitter slope for 113.4375 GBd is based on 4 MHz, 0.05 UI pk-pk, the LF jitter slope for 106.25 GBd must match in absolute time units (not UI) so that there is not an unbounded buffering requirement (or one jitter slope can be modified in shape).

SuggestedRemedy

In the FECi clauses, instead of 2e5/f, 0.05 UI, use 2.13e5/f, 0.053 UI. Or, here and in the other non-FECi PMD and PMA clauses, use 1.875e5/f, 0.047 UI.

Proposed Response　　　　*Response Status*　**O**

Cl **180**　　*SC* **180.10**　　　　*P* **368**　　　*L* **11**　　　　# 521

Dawe, Piers　　　　　　　　　　　　　Nvidia

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

Bit number should match number of lanes

SuggestedRemedy

Change 1.9.4 to 1.9.n. Below, change 1.10.4 to 1.10.n. Similarly in other clauses.

Proposed Response　　　　*Response Status*　**O**

Cl **176E**　　*SC* **176E.5.2**　　　　*P* **633**　　　*L* **33**　　　　# 522

Dawe, Piers　　　　　　　　　　　　　Nvidia

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

decision-feedback equalizer? The table mentions "feed-forward coefficient"

SuggestedRemedy

Update this text

Proposed Response　　　　*Response Status*　**O**

Cl **176E**　　*SC* **176E.5.2**　　　　*P* **636**　　　*L* **49**　　　　# 523

Dawe, Piers　　　　　　　　　　　　　Nvidia

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

"within the time interval t_s +/-0.05 UI and with accumulated probability for each sample weighted by the function w(t) defined by Equation (176E-4)": this makes the measurement too tolerant to jitter.

SuggestedRemedy

Remove the Gaussian weighting function w(t), increase +/-0.05 to +/-0.07, same as TDECQ. This will make VEC look worse, but will be a better measurement to protect the link. Use this method for CR also, with "software channel" ("far end eye measurement") as appropriate.

Proposed Response　　　　*Response Status*　**O**

Cl **179A**　　*SC* **179A.4**　　　　*P* **663**　　　*L* **50**　　　　# 524

Dawe, Piers　　　　　　　　　　　　　Nvidia

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

Defining a "host channel" that includes most of the host but leaves out the connector, is not helpful. The connector is part of the host and its loss is significant.

SuggestedRemedy

Define the recommended channel either from pad TP0d to the outside of the connector, or more usefully, from TP0d to TP2 (the loss from outside of the connector to TP2 is the HCB loss which will be well defined)

Proposed Response　　　　*Response Status*　**O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected　　RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **524**

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Cl **179C**   *SC* **179C.1**   *P* **680**   *L* **15**   # 525

Dawe, Piers   Nvidia

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

MDIs are mechanical entities. For 106.25 GBd operation, there are SFP2 (SFF-TA-1031) and QSFP2 (SFF-TA-1027). Any "SFP224" would be an SFP2 module or cable end with 200G-capable circuitry. But this annex is for the MDI, not the circuitry. Similarly for "QSFP224" and QSFP2.

SuggestedRemedy

Correct the names. Add references to SFF-TA-1011 which relates the names and specs for the SNIA-SFF modules, and SFF-8665, which defines the components of a QSFPx "solution".

Proposed Response   *Response Status* **O**

Cl **179C**   *SC* **179C.1**   *P* **680**   *L* **17**   # 526

Dawe, Piers   Nvidia

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

Refer to the specification for each connector type where each is first mentioned.
See another comment against 1.3 for the reference docs.

SuggestedRemedy

Per comment

Proposed Response   *Response Status* **O**

Cl **179C**   *SC* **179C.2.3**   *P* **688**   *L* **35**   # 527

Dawe, Piers   Nvidia

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

This says "the mechanical interface". The mechanical spec is SFF-TA-1027, QSFP2. It is a standard, not an MSA.

SuggestedRemedy

Change " the TBD MSA" to "SFF-TA-1027".

Proposed Response   *Response Status* **O**

Cl **179C**   *SC* **179C.2.4**   *P* **689**   *L* **35**   # 528

Dawe, Piers   Nvidia

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

There is no QSFP-DD1600 TBD MSA document. QSFP-DD1600 is defined in the singular QSFP-DD MSA document

SuggestedRemedy

Change "the QSFP-DD1600 TBD MSA" to "the QSFP-DD/QSFP-DD800/QSFP-DD1600 Hardware Specification".

Proposed Response   *Response Status* **O**

Cl **179C**   *SC* **179C.2.5**   *P* **690**   *L* **21**   # 529

Dawe, Piers   Nvidia

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

There is no OSFP1600 TBD MSA document. OSFP1600 is defined in the singular OSFP MSA document, particularly section 4.

SuggestedRemedy

Change "the OSFP1600 TBD MSA" to "the OSFP Octal Small Form Factor Pluggable Module specification" or "section 4 of the OSFP Octal Small Form Factor Pluggable Module specification".

Proposed Response   *Response Status* **O**

Cl **116**   *SC* **116.1.4**   *P* **94**   *L* **6**   # 530

Rechtman, Zvi   Nvidia

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

The comment refers to Table 116–3.
The SM_PMA and BM_PMA introduce a new case of optional PMA implementation. For instance 200GBASE-KR2 PHY cannot implement SM_PMA without implementing 200GAUI-1 C2C interface.
It will be beneficial to add a note about the conditions which allow/require implementation of BM_PMA and SM_PMA
Same apply to Table 116–3a, Table 116–4, Table 169–2

SuggestedRemedy

Add a footnote labeled 'b' next to the 'O' marking for 200GBASE-R SM-PMA in the entries for 200GBASE-KR2, 200GBASE-KR4, 200GBASE-CR2, and 200GBASE-CR4. The footnote 'b' should state: 'Applicable only when 200GAUI-1 C2C interface is used within the PHY

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **530**   Page 97 of 118
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Cl **116**   *SC* **116.5**   *P* **106**   *L* **5**   # 531

Rechtman, Zvi   Nvidia

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

The comment refers to Table 116–8.
There is an additional logical skew present in the 200GBASE-R and 400GBASE-R2
BM_PMA of 2 RS-FEC CWs. These skew values should not be included in the skew
budget calculations for this table. To prevent misinterpretations, an explicit note is required

SuggestedRemedy

Insert a note in Table 116–8 that states: 'The additional 2 RS-FEC CWs logical skew in
clause 176 BM_PMA for 200GBASE-R and 400GBASE-R should not to be factored in the
skew budget calculations for this table

Proposed Response   *Response Status* **O**

Cl **169**   *SC* **169.4**   *P* **123**   *L* **5**   # 532

Rechtman, Zvi   Nvidia

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

The comment refers to Table 169–4.
The Inner-FEC delay appears to be missing from the table

SuggestedRemedy

add 800GBASE-R inner FEC (values are TBDs)

Proposed Response   *Response Status* **O**

Cl **176**   *SC* **176.5.1.1**   *P* **200**   *L* **1**   # 533

Rechtman, Zvi   Nvidia

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

The comment refers to Figure 176–2.
The functions of "Delay odd PCSLs
by 2 RS-FEC codewords" on Tx path and "Delay even PCSLs by 2 RS-FEC codewords"
can be misleading, as they could be interpreted as a delay by 10,880 symbols.
The intention is to delay the odd (Tx) and even (Rx) PCSLs by 136 symbols in order to get
multiplex and demultiplex symbols from different 2 RS-FEC CWs.
Same apply to Figure 176–9

SuggestedRemedy

Modify the description in the Tx path box from "Delay odd PCSLs by 2 RS-FEC codewords"
to "Delay odd PCSLs by 136 symbols" and in the Rx path box from "Delay even PCSLs by
2 RS-FEC codewords" to "Delay even PCSLs by 136 symbols"

Proposed Response   *Response Status* **O**

Cl **176**   *SC* **176.5.1.3.1**   *P* **201**   *L* **28**   # 534

Rechtman, Zvi   Nvidia

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

There is reference in the text to lock process in Figure 119-12. However, there are
exceptions to Figure 119-12 as outlined in 176.5.1.6.
It can be beneficial to refer to 176.5.1.6 which include both the reference to Figure 119-12
and the list of exceptions list

SuggestedRemedy

Add a reference to 176.5.1.6 instead of Figure 119-12

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Comment ID* **534**   Page 98 of 118
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   5/3/2024 10:09:29 AM
SORT ORDER: Comment ID

Cl **176**   *SC* **176.5.1.3.3**   *P* **202**   *L* **45**   # 535

Rechtman, Zvi   Nvidia

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

The comment refers to Figure 176-4
The diagram represent a specific skew case between PCS lane, for instance in the
absence of skew between the original PCS lanes, the "first" symbol A might be created by
different A codeword which should be denote by A'.

SuggestedRemedy

Option1:
Modify only the first A symbol of the odd PCS lanes to be A'.
Option2:
Split the drawing into two: one for 200GBASE-R and another for 400GBASE-R. Then, add
index numbers to the A, B symbols.
This could make it easier to understand the drawings and the roles of the symbols in each
context.

Proposed Response   *Response Status* **O**

Cl **176**   *SC* **176.5.1.3.4**   *P* **203**   *L* **45**   # 536

Rechtman, Zvi   Nvidia

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

The comment refers to Figure 176-5
The diagram represents a specific skew case between PCS lanes. For instance in the
absence of skew between the PCS lanes in the PMA:IS_UNITDATA_0:7.request primitive,
the first symbol of A' of the odd PCS lane should be marked as A'' because of the
additional one symbol delay prior to the 136 symbols delay

SuggestedRemedy

Option1:
Modify only the first A' symbol of the odd PCS lanes to be A''.

Option2:
Split the drawing into two: one for 200GBASE-R and another for 400GBASE-R. Then, add
index numbers to the A, B and A', B' symbols.
This could make it easier to understand the drawings and the roles of the symbols in each
context.

Proposed Response   *Response Status* **O**

Cl **176**   *SC* **176.5.1.3.4**   *P* **202**   *L* **51**   # 537

Rechtman, Zvi   Nvidia

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

The sentence "This is equivalent to adding a delay of 2 RS-FEC codewords to the odd PCS
lanes (2 codewords × 544 symbols per codeword / 8 PCS lanes = 136 symbols)."
can be misinterpreted:
136 symbol delay x 4 odd PCS lanes = 544 symbols delay in total (not 2 RS-FEC
codewords delay)

SuggestedRemedy

Remove "This is equivalent to adding a delay of 2 RS-FEC codewords to the odd PCS
lanes (2 codewords × 544 symbols per codeword / 8 PCS lanes = 136 symbols)."

Modify: "Adding the two codeword delay to odd numbered lanes enables the multiplexing of
four consecutive RSFEC symbols from four different codewords at the output of the 8:1
symbol multiplexer."
To: "Adding the 136 symbol delay to odd numbered lanes enables the multiplexing of four
consecutive RSFEC symbols from four different codewords at the output of the 8:1 symbol
multiplexer."

Proposed Response   *Response Status* **O**

Cl **176**   *SC* **176.5.1.6.6**   *P* **208**   *L* **34**   # 538

Rechtman, Zvi   Nvidia

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

The comment refers to Figure 176–8—PMA receive symbol-pair lock state diagram
The state diagram is defined as single state machine per the entire PMA. However, each
PMA lane may have a different reference skew, leading to varying SLIP operation
requirements per PMA lane (e.g. one PMA lane doesn't require SLIP because all PCS
lanes of that lane are locked, but other PMA lane still need to skew to find the 20 symbol bit
boundaries)therefore the state diagram should be define per PMA lane and not for per PMA.

SuggestedRemedy

Modify the state diagram per PMA lane and not per PMA, this include change in the
variables to be defined per <y>:
restart_lock_demux<y>
symbol_pair_lock_demux<y>
start symbol_pair_lock_counter_demux<y>
symbol_pair_lock_demux<y>

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
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Cl **176**   *SC* **176.6.1**   *P* **214**   *L* **53**   # 539

Rechtman, Zvi   Nvidia

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

The comment refers to Figure 176–11.
The functions of "Delay odd PCSLs
by 2 RS-FEC codewords" on Tx path and "Delay even PCSLs by 2 RS-FEC codewords"
can be misleading, as they could be interpreted as a delay by 10,880 symbols.
The intention is to delay the odd (Tx) and even (Rx) PCSLs by 68 symbols in order to get
multiplex and demultiplex symbols from different 2 RS-FEC CWs.
Same apply to Figure 176–13

SuggestedRemedy

Modify the description in the Tx path box from "Delay odd PCSLs by 2 RS-FEC codewords"
to "Delay odd PCSLs by 68 symbols" and in the Rx path box from "Delay even PCSLs by 2
RS-FEC codewords" to "Delay even PCSLs by 68 symbols"

Proposed Response   *Response Status* **O**

Cl **176**   *SC* **176.9.1.2**   *P* **242**   *L* **12**   # 540

Rechtman, Zvi   Nvidia

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

The text currently refers to xAUI-n C2C. However, the adopted PMA baseline proposal
stated that the "Precoding capability in all physically instantiated interfaces is 'Tx:required,
Rx:optional'" (per ran_3dj_01a_2303 slide 10). This specification should also encompass
xAUI-n C2M.

SuggestedRemedy

Add xAUI-n C2M

Proposed Response   *Response Status* **O**

Cl **176**   *SC* **176.9.1.2**   *P* **242**   *L* **23**   # 541

Rechtman, Zvi   Nvidia

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

The paragraph refers only to the case of PMD control function operation, need to refer to
Annex 176A for all electrical interfaces

SuggestedRemedy

Replace:
"If the PMA is connected to the service interface of an xBASE-CRn or xBASE-KRn PMD
and training is enabled by the management variable mr_training_enable (see 136.7), then
recoder_tx_out_enable_i and precoder_rx_in_enable_i shall be set as determined by the
PMD control function in the LINK_READY state on lane i (see 136.8.11.7.5 and Figure
136–7). The method by which the MD control function affects these variables is
implementation dependent."

With:
"If the PMA support the Control function and start-up protocol for electrical interfaces and
training is enabled by the management variable mr_training_enable (see Annex 176A),
then precoder_tx_out_enable_i and
precoder_rx_in_enable_i shall be set as determined by the control function in the
LINK_READY state on lane i (see 176A.10.4 and Figure 176A–6). The method by which
the PMA control function affects these
variables is implementation dependent"

Proposed Response   *Response Status* **O**

Cl **176A**   *SC* **176A.10.4**   *P* **566**   *L* **54**   # 542

Rechtman, Zvi   Nvidia

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

The operation of precoding after the completion of the start-up protocol is missing

SuggestedRemedy

Add the following text:
"If the LINK_READY state is entered with local_tp_mode set to "PAM4 with precoding",
then the PMA shall transmit all subsequent data on the corresponding lane with precoding
(see
176.9.1.2).
If the LINK_READY state is entered with remote_tp_mode set to "PAM4 with precoding",
then the PMA shall subsequently received data on the corresponding lane includes
precoding (see 176.9.1.2)"

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
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Comment ID **542**   Page 100 of 118
5/3/2024 10:09:29 AM

Cl **177**   *SC* **177.1.4**   *P* **250**   *L* **32**   # 543

Rechtman, Zvi   Nvidia

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

The comment refers to Figure 177–2.
There is a footnote that PAM4 decoding is optional in case of soft decoding.
However, the DataPath is defined using bit streams, also the
FEC:IS_UNITDATA_i.indication primitives has two value of 0 or 1, therefore PAM4
decoding must to take place

SuggestedRemedy

Either remove the footnote, or elaborate on the intention of this footnote.

Proposed Response   *Response Status* **O**

Cl **177**   *SC* **177.4.1**   *P* **251**   *L* **51**   # 544

Rechtman, Zvi   Nvidia

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

The values of Q and the description of the Convolutional interleaver functionality doesn't
match the adopted values in he_3dj_01_2307.pdf
The values should be:
200G BASE-R: Q = 192
400G BASE-R: Q = 96
800G BASE-R: Q = 48
1.6T BASE-R: Q = 24

SuggestedRemedy

Modify the Q values to:
200G BASE-R: Q = 192
400G BASE-R: Q = 96
800G BASE-R: Q = 48
1.6T BASE-R: Q = 24

Proposed Response   *Response Status* **O**

Cl **177**   *SC* **177.4.1**   *P* **256**   *L* **50**   # 545

Rechtman, Zvi   Nvidia

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

The description in "The convolutional interleaver is composed of 3 delay lines where the
first delays the PHYs data by eight RS-FEC codewords, the second by four RS-FEC
codewords and the last adds no delay"
Seems to represent block interleave and not convolutional interleave.

SuggestedRemedy

Modify to:
"The convolutional interleaver is composed of 3 delay lines.
For 200GBASE-R the first line (line0) delays the PHYs data by 4x2x192 = 1,536 RS-FEC
Symbols, the second line (line1) by 4x1x192 = 768 RS-FEC symbols and the last line
(line3) adds no delay.
For 400GBASE-R the first line (line0) delays the PHYs data by 4x2x96 = 768 RS-FEC
Symbols, the second line (line1) by 4x1x96 = 384 RS-FEC symbols and the last line (line3)
adds no delay
For 800GBASE-R the first line (line0) delays the PHYs data by 4x2x48 = 384 RS-FEC
Symbols, the second line (line1) by 4x1x48 = 192 RS-FEC symbols and the last line (line3)
adds no delay
For 1.6TBASE-R the first line (line0) delays the PHYs data by 4x2x24= 192 RS-FEC
Symbols, the second line (line1) by 4x1x24 = 96 RS-FEC symbols and the last line (line3)
adds no delay.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Comment ID* **545**   Page 101 of 118
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   5/3/2024 10:09:29 AM
SORT ORDER: Comment ID

Cl **177**   *SC* **177.4.1**   *P* **256**   *L* **53**   # 546

Rechtman, Zvi   Nvidia

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

The input and output round-robin operation is defined relatively to the delay/buffering size of each lane. However, there are lines index that represent the delay and simplify the definition.

SuggestedRemedy

Change:
"The input data round-robins between the three delay lines beginning with the eight RS-FEC delay line, then the four RS-FEC delay line and lastly the zero delay line. The output of the convolutional interleaver round-robins between the three delay lines receiving one RS-FEC symbol-quartet from each at a time beginning with the eight RS-FEC delay line, then four RS-FC delay line, and lastly the zero delay line"

To:
"The input data round-robins between the three delay lines beginning with the line0, then line1 delay line and lastly line2. The output of
the convolutional interleaver round-robins between the three delay lines receiving one RS-FEC symbol-quartet (4 symbols) from each at a time beginning with line0, then line1, and lastly line2"

Proposed Response   *Response Status*   **O**

Cl **177**   *SC* **177.4.7.2**   *P* **256**   *L* **12**   # 547

Rechtman, Zvi   Nvidia

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

The 128,120 Hamming code is very sensitive to error propagation since it can correct up to one error in hard decoding and three errors in soft decoding. Hence, precoding is required

SuggestedRemedy

Add precoding, and use the same definition of precoding similar to 176.9.1.2.

Proposed Response   *Response Status*   **O**

Cl **176A**   *SC* **176A.2.3.3**   *P* **552**   *L* **34**   # 548

Rechtman, Zvi   Nvidia

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

In the case of multi-lane operation, if all lanes exits the QUIET state simultaneously and use the same PRBS31 initial seed, there will be an undesired crosstalk effect. This potential issue needs to be addressed

SuggestedRemedy

Explicitly define that each lane must use different initial seed.

Proposed Response   *Response Status*   **O**

Cl **176A**   *SC* **176A.4**   *P* **555**   *L* **10**   # 549

Rechtman, Zvi   Nvidia

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

The comment refers to Table 176A–3—Status field structure.
The field in bit 14 - "One" require some explanation. It's unclear whether it refers to the support of the newly adopted test patterns, the support of multi-segment operation, or both.

SuggestedRemedy

Define the purpose of this bit

Proposed Response   *Response Status*   **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   Comment ID **549**   Page 102 of 118
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   5/3/2024 10:09:29 AM
SORT ORDER: Comment ID

Cl **176A**   *SC* **176A.10.4**   *P* **568**   *L* **48**   # 550

Rechtman, Zvi   Nvidia

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

The comment refers to Figure 176A–6—Interface control state diagram.
The RECOVERY state coupled with the absence of timeouts, introduces a new challenge in identifying marginal performance cases. These cases may lead to repeated transitions between TRAIN_LOCAL/TRAIN_REMOTE/SEGMENT_READY state to/from RECOVERY state in scenarios of alternating local_tf_lock.
A possible solution is to limit the number of RECOVERY events by counting and limiting the number of transitions to the RECOVERY state.

SuggestedRemedy

Define a new counter: "recovery_event_count". This counter increments each time the control state diagram transitions into the RECOVERY state.

Effects on the state diagram:
The "recovery_event_count" should be initialized to 0 in the "SEND_TRAINING" state.
Upon entering the RECOVERY state, the "recovery_event_count" should be incremented by 1.

State diagram transition change:
The transition condition from the RECOVERY state to the FAIL state needs to be modified as follows:
Change "recovery_timer done" to "recovery_timer done || recovery_event_count > X", where X is 5 (or to be determined).

Proposed Response   *Response Status*   **O**

Cl **176A**   *SC* **176A.10.4**   *P* **568**   *L* **20**   # 551

Law, David   HPE

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

There is a spurious '<' withing the transition condition from the state TRAIN_LOCAL to the state TRAIN_REMOTE.

SuggestedRemedy

Suggest that 'local_tf_lock<* local_rx_ready' should read 'local_tf_lock * local_rx_ready'.

Proposed Response   *Response Status*   **O**

Cl **176A**   *SC* **176A.10.4**   *P* **568**   *L* **20**   # 552

Law, David   HPE

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

There should be an underscore between the timer name and 'done'.

SuggestedRemedy

Suggest that 'recovery_timer done' should be changed to read 'recovery_timer_done'.

Proposed Response   *Response Status*   **O**

Cl **176A**   *SC* **176A.10.1**   *P* **562**   *L* **53**   # 553

Law, David   HPE

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

Subclause 176A.10.1 'State diagram conventions' says that 'The notation used in the state diagrams follows the conventions of 21.5.', however subclause 21.5 does not address the operation of timers.

SuggestedRemedy

Suggest that the text 'All timers operate in the manner described in 14.2.3.2.' be inserted as the new second sentence of the second paragraph of subclause 176A.10.1.

Proposed Response   *Response Status*   **O**

Cl **176A**   *SC* **176A.9.2**   *P* **562**   *L* **22**   # 554

Law, David   HPE

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

The arrow pointing to the Interface A 'Driver' block and arrow point-ing from the Interface B 'CDR' block both seem to be pointing in the wrong direction.

SuggestedRemedy

Reverse the direction of both arrows.

Proposed Response   *Response Status*   **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
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Cl **176A**　　*SC* **176A.9.2**　　　　*P***562**　　　*L***14**　　　　# 555

Law, David　　　　　　　　　　　HPE

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

Figure 176A–5 'Retimer reference model' shows the data multiplexor driven by the tx_mode value, with the multiplexor select set to 0 when tx_mode = training and set to 1 when tx_mode = data. Subclause 176A.10.2.1 'Variables', however, defines three values for tx_mode, training, local_pattern and data. Figure 176A–5, therefore, does not define the multiplexor select value for when tx_mode = local_pattern.

SuggestedRemedy

Update the figure to reflect the third value of tx_mode and the local pattern generator for each interface.

Proposed Response　　　　*Response Status*　**O**

Cl **176A**　　*SC* **176A.10.4**　　　*P***569**　　　*L***17**　　　　# 556

Law, David　　　　　　　　　　　HPE

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

The WAIT_ADJACENT to SWITCH_CLOCK transition condition uses the variable mr_training_enabled, however subclause 176A.10.2.1 'Variables' defines the variable mr_training_enable, not mr_training_enabled.

SuggestedRemedy

Change the transition condition ' (!mr_training_enabled + segment_ready) * ...' to read ' (!mr_training_enable + segment_ready) * ...'.

Proposed Response　　　　*Response Status*　**O**

Cl **176A**　　*SC* **176A.10.4**　　　*P***570**　　　*L***9**　　　　# 557

Law, David　　　　　　　　　　　HPE

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

Subclause 176A.10.1 'State diagram conventions' says that 'The notation used in the state diagrams follows the conventions of 21.5.'. Subclause 21.5.3 'State transitions' says 'The following terms are valid transition qualifiers:' and item d) says 'An unconditional transition: UCT'. As a result, it is not necessary to expand UCT on it's first use in Annex 176A.

SuggestedRemedy

Change the text 'UCT (unconditional transition)' to read 'UCT'.

Proposed Response　　　　*Response Status*　**O**

Cl **184**　　*SC* **184.6.5**　　　　*P***463**　　　*L***6**　　　　# 558

Law, David　　　　　　　　　　　HPE

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

The variable 'alignnment_status' used in the LOSS_OF_ALIGNMENT and ALIGNMENT_ACQUIRED states is misspelt.

SuggestedRemedy

Suggest that 'alignnment_status' should read 'alignment_status'.

Proposed Response　　　　*Response Status*　**O**

Cl **184**　　*SC* **184.6.5**　　　　*P***462**　　　*L***9**　　　　# 559

Law, David　　　　　　　　　　　HPE

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

The LOCK_INIT state in Figure 184–9 'DSP lock state diagram' includes the action 'test_sym <= false', however the test_sym variable isn't defined in subclause 184.6.2 'Variables' and isn't used anywhere else in Figure 184–9.

It seems that this should have been 'test_ps <= false' as the test_ps variable isn't initialised during reset in the LOCK_INIT state but used to control the GET_SYMBOL to FIND_1ST transition below.

SuggestedRemedy

Change 'test_sym <= false' to read 'test_ps <= false'.

Proposed Response　　　　*Response Status*　**O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
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Comment ID **559**

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Cl **184**   *SC* **184.6.5**   *P* **462**   *L* **22**   # 560

Law, David   HPE

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

N (the number of consecutive PS symbols matching the expected value for a given polarization stream required to enter frame lock), and M (the number of consecutive PS symbols that don't match the expected value for a given polarization stream required to exit frame lock) used in Figure 184–9 'DSP lock state diagram' aren't defined in subclause 184.6 'Inner FEC state diagrams' or its subclauses.

Suggest that these values should be defined in one place (I assume in subclause 184.5.4 'DSP frame synchronization and pilot removal' which includes the text 'The values of N and M are TBD.), with a pointer to this subclause elsewhere.

SuggestedRemedy

[1] Insert a new subclause 184.6.5 'Constants' as follows, renumbering the following subclause.

184.6.5 Constants
M
The number of consecutive PS symbols that fail to match the expected value for a given polarization stream required to exit frame lock (see 184.5.4).
N
The number of consecutive PS symbols matching the expected value for a given polarization stream required to enter frame lock (see 184.5.4).

{2} In subclause 184.6.2 'Variables', change the text 'It is set to true when TBD PS symbols ...' to read 'It is set to true when M PS symbols ...' in the variable 'restart_lock' description.

Proposed Response   *Response Status* **O**

Cl **176A**   *SC* **176A.2.2**   *P* **549**   *L* **9**   # 561

Law, David   HPE

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

Subclause 176A.2.2 'Control and status fields' says that 'The control field comprises 16 bits with the structure defined in 176A.3.', yet figure 176A–1 'Training frame structure' above shows the control field comprising of 16 cells. It, therefore, appears that the field is comprised of 16 cells that convey 16 bits.

SuggestedRemedy

[1] Change the first paragraph of 176A.2.2 to read 'The control field is comprised of 16 cells which convey 16 bits with the structure defined in 176A.3. The status is comprised of 16 cells which convey 16 bits with the structure defined in 176A.4.

[2] Change the last sentence of the penultimate paragraph of 176A.2.2 to read 'Within each field, the order of transmission is from bit 15 to bit 0, conveyed by cell 15 to cell 0 respectively.'.

Proposed Response   *Response Status* **O**

Cl **176A**   *SC* **176A.2.2**   *P* **549**   *L* **25**   # 562

Law, David   HPE

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

Subclause 176A.2.2 says '... if a violation of the DME encoding rules is detected within the control field or the status field, the contents of both fields in that frame are ignored.'. If this is requirement, suggest it should be stated using a 'shall' statement.

SuggestedRemedy

Change '... the contents of both fields in that frame are ignored.' to read '... the contents of both fields in that frame shall be ignored.'.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **562**   Page 105 of 118
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Cl **176A**   *SC* **176A.2.1**   *P* **547**   *L* **3**   # **563**

Law, David   HPE

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

The first 'shall' statement in Annex 176A (normative) 'Control function and start-up protocol for electrical interfaces' is in 176A.2.3.1 'PRBS13 function'. It seems, however, that there should be 'shall' statements in relation to the entire Training frame structure.

SuggestedRemedy

[1] In subclause 176A.2.1, change 'The training frame marker is a run ...' to read   'The training frame marker shall be a run ...'.
[2] In subclause 176A.2.2, change 'The control field comprises ...' to read   ' The control field shall be comprised of ...'.
[3] In subclause 176A.2.2, change 'The status field comprises ...' to read   ' The status field shall be comprised of ...'.
[4] In subclause 176A.2.3, change 'The training pattern is the result of a   ...' to read 'The training pattern shall be the result of a ...'.

Proposed Response   *Response Status*   **O**

Cl **176A**   *SC* **176A.4.8**   *P* **556**   *L* **37**   # **564**

Law, David   HPE

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

176A.4.8 'Coefficient status' says that 'The acknowledge reflects the value of coef_sts resulting from the procedure described in 176A.6.3.'. I don't see a procedure that sets coef_sts in 176A.6.3, but there is one in 176A.6.4. With that said, is it correct that it is just this procedure that sets coef_sts? On review of Figure 176A–9 'Coefficient update state diagram', I see it directly sets coef_sts to 'not_upd' in the OUT_OF_SYNC state and indirectly sets coef_sts using the procedure described in 176A.6.4 through calls to the UPDATE_C(k) function in the NEW_REQUEST state. This seems to be confirmed by the first paragraph of 176A.6.4 which says 'The handling of incoming requests is specified by the coefficient update state diagram (Figure 176A–9). The behavior of the UPDATE_C(k) function shall be consistent with the following algorithm.'.

SuggestedRemedy

Change 'The acknowledge reflects the value of coef_sts resulting from the procedure described in 176A.6.3.' to read 'The coefficient status bits reflect the value of coef_sts variable generated by the coefficient update state diagram (Figure 176A–9).'.

Proposed Response   *Response Status*   **O**

Cl **176A**   *SC* **176A.6.4**   *P* **558**   *L* **21**   # **565**

Law, David   HPE

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

176A.6.4 says that 'The variables coef_req, coef_sts, and k are defined in 176A.10.3.1.', however, 176A.10.3.1 'Variables' uses all lowercase for the coef_sts values (e.g., updated, coefficient at limit and equalization limit) and coef_req (e.g, decrement, increment) whereas 176A.10.3.1 uses all uppercase for the coef_sts values (e.g., UPDATED, COEFFICIENT AT LIMIT AND EQUALIZATION LIMIT) and coef_req (e.g., DECREMENT, INCREMENT).

SuggestedRemedy

The formatting of the variable values defined in 176A.10.3.1 'Variables' and used in 176A.6.4 should match.

Proposed Response   *Response Status*   **O**

Cl **176A**   *SC* **176A.10.2.1**   *P* **563**   *L* **44**   # **566**

Law, David   HPE

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

The last sentence of the tx_disable variable description says that the '... output on the lane is disabled.'. Is this correct, the first sentence says that tx_disable '... controls the transmitter's output on the interface.' and tx_disable is defined under subclause 176A.10.2 'Per-interface variables, functions and timers'. Suggest that the reference to 'lane' is changed to 'interface', or use 'all lanes of the interface' in the variable description to reflect the segment_ready variable description immediately above.

SuggestedRemedy

Either

[a] Change the text '... output on the lane is disabled.' in the last sentence of the tx_disable variable description to read '... output on the interface is disabled.'.

or

[b] Change [1] the text '... the transmitter's output on the interface.' in the first sentence of both the tx_disable and tx_mode variable descriptions to read '... the transmitter output on all lanes of the interface.'; and [2] the text '... output on the lane is disabled.' in the last sentence of the tx_disable variable description to read '... output on all lanes of the interface is disabled.'.

Proposed Response   *Response Status*   **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

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Cl **176A**   *SC* **176A.10.2.1**   *P* **563**   *L* **44**   # 567

Law, David   HPE

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

Suggest a description of what happens when the tx_disable variable is set to false is added to the variable description.

SuggestedRemedy

[1] Add 'When it is false, tx_mode controls the content of the transmitter's output on the interface.' or 'When it is false, tx_mode controls the content of the transmitter's output on all lanes of the interface.', depending on the response to my other comment, to the end of the tx_disable variable description.

[2] Change the text '... of the interface.' in the first sentence of the tx_mode variable description to read '... of the interface when tx_disable is false.'.

Proposed Response   *Response Status*   **O**

Cl **176A**   *SC* **176A.6.4**   *P* **558**   *L* **46**   # 568

Law, David   HPE

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

Change 'coef_sts = COEFFICENT AT LIMIT' (COEFFICIENT misspelt) to read 'COEFFICIENT AT LIMIT'

SuggestedRemedy

See comment.

Proposed Response   *Response Status*   **O**

Cl **176A**   *SC* **176A.10.3.3**   *P* **566**   *L* **21**   # 569

Law, David   HPE

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

176A.10.3.3 'Timers' is a subclause of 176A.10.3 'Per-lane variables, functions, timers and counters', yet the three times listed, quiet_timer, propagation_timer and recovery_timer are all used by the interface control state diagram. 176A.10.2 'Per-interface variables, functions and timers' says 'A device implements one instance of each of the interface control state diagrams, and the set of associated variables, functions, counters and timers defined in this subclause, independently for each of its interfaces(see 176A.9).' As a result, it seems these timers should be moved to 176A.10.2.3 'Timers' and the descriptions should be updated to reflect that they operate on a per-interface basis.

SuggestedRemedy

[1] Move the quiet_timer, propagation_timer and recovery_timer definitions to 176A.10.2.3 'Timers' and delete 176A.10.3.3 'Timers'.
[2] Change the text '... the interface control state diagram on a lane enters the ...' in the description of quiet_timer, propagation_timer and recovery_timer to read '... the interface control state diagram on an interface enters the ...'.

Proposed Response   *Response Status*   **O**

Cl **176A**   *SC* **176A.10.4**   *P* **566**   *L* **52**   # 570

Law, David   HPE

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

176A.10.2 'Per-interface variables, functions and timers' says 'A device implements one instance of each of the interface control state diagrams independently for each of its interfaces (see 176A.9).' and 176A.10.4 'State diagrams' says 'The interface control state diagram (Figure 176A–6) defines the operation of the startup protocol for AUIs and PMDs'. 176A.10.4 'State diagrams', however, goes on to say, 'The interface control, frame lock and coefficient update state diagrams shall be implemented for each lane.'. This doesn't seem to be in alignment with the prior text and doesn't seem to be correct.

SuggestedRemedy

Change the last paragraph of 176A.10.4 to read 'The interface control and RTS update state diagrams shall be implemented for each interface of a device. The frame lock and coefficient update state diagrams shall be implemented for each lane of each interface of a device.'.

Proposed Response   *Response Status*   **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
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Comment ID **570**

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Cl **176A**   *SC* **176A.10.3**   *P* **564**   *L* **16**   # 571

Law, David   HPE

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

176A.10.3 'Per-lane variables, functions, timers and counters' says 'The device implements one instance of each of the interface control state diagrams, and the set of associated ... for each of the n physical lanes on each of its interfaces (see 176A.9)'. I don't think this is correct as I believe that the interface control state diagram is one for each interface of a device (see 176A.10.2), and it is the frame lock and coefficient update state diagrams that are one for each lane of each interface of a device.

SuggestedRemedy

Change ''The device implements one instance of each of the interface control state diagrams ...' to read 'The device implements one instance of each of the frame lock and coefficient update state diagrams ...'.

Proposed Response   *Response Status* **O**

Cl **176A**   *SC* **176A.10.3.1**   *P* **565**   *L* **5**   # 572

Law, David   HPE

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

The variables local_tf_lock, remote_tf_lock, local_rx_ready and remote_rx_ready are all defined in 176A.10.3 'Per-lane variables, functions, timers and counters' and are related to a lane, yet they are used by figure 176A-6 'Interface control state diagram'. 176A.10.2 'Per-interface variables, functions and timers' says 'A device implements one instance of each of the interface control state diagrams independently for each of its interfaces (see 176A.9).'.

SuggestedRemedy

Perhaps figure 176A-6 'Interface control state diagram' should use a 'interface' version of each of these variables that are a logical AND of the respective lane variable in the case of a multi-lane interface.

Proposed Response   *Response Status* **O**

Cl **176A**   *SC* **176A.10.3.1**   *P* **565**   *L* **7**   # 573

Law, David   HPE

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

The description of the local_tf_lock variable in 176A.10.3.1 says that 'The value of this variable is encoded as the "training lock" bit in the status field of transmitted training frames.', however, there isn't a "training lock" bit defined for the training frames. Since 176A.4.3 'Receiver frame lock' says 'Receiver frame lock ... is not set to 1 until training and local_tf_lock are both true.' it seems that local_tf_lock is encoded in the 'Receiver frame lock' bit.

SuggestedRemedy

Change the text '... is encoded as the "training lock" bit ...' in the local_tf_lock variable description to read '.... is encoded in the "Receiver frame lock" bit ...'.

Proposed Response   *Response Status* **O**

Cl **176A**   *SC* **176A.4.3**   *P* **556**   *L* **4**   # 574

Law, David   HPE

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

176A.4.3 'Receiver frame lock' says that 'When the receiver frame lock bit is set to 1, the receiver is indicating that it has identified training frame marker positions and is in a state where the response time requirements specified in 176A.10 are met.'. It then goes on to say 'Receiver frame lock ... is not set to 1 until training and local_tf_lock are both true.'.

176A.10 is 'Variables, functions, timers, counters, and state diagrams', so I wonder if the reference should be to 176A.8 'Handshake timing'? In addition, I don't believe the variables training and local_tf_lock are conditioned on the response time requirements specified in 176A.10 being met, at least I didn't see it in their descriptions.

SuggestedRemedy

In 176A.4.3 change the text '... response time requirements specified in 176A.10 are met.' to read '... response time requirements specified in 176A.8 are met.' and the text '... and is not set to 1 until training and local_tf_lock are both true.' To read '... and is not set to 1 until training and local_tf_lock are both true and the response time requirements specified in 176A.10 can be met.'

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
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Comment ID **574**

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Cl **176A**   *SC* **176A.10.4**   *P* **571**   *L* **9**   # 575

Law, David   HPE

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

The UPDATE_IC function is called in the OUT_OF_SYNC state of the Figure 176A–9 Coefficient update state diagram. The UPDATE_IC function uses the ic_req variable to set the coefficients (see 176A.6.2), and the ic_req variable is derived from the 'initial condition request' bits from the control field of the received training frames (see 176A.10.3.1).

Since, however, the OUT_OF_SYNC state is entered during reset (reset or mr_restart set true), it would seem unlikely that training frames are being received. If that is the case, it isn't clear what the value of the ic_req variable is, and therefore what the coefficients should be set to.

176A.6.2 says that 'The transmitter equalizer is set to preset 1 upon entry to the QUIET state of the interface control state diagram.'. Since the QUIET state of the Interface control state diagram is also entered during reset, it seems the coefficients should be set to preset 1 when the Coefficient update state diagram is in the OUT_OF_SYNC state.

SuggestedRemedy

[1] Delete the first sentence of the ic_req definition in 176A.10.3.1.
[2] Add the text 'If the Coefficient update state diagram is in the OUT_OF_SYNC state ic_req is set to preset 1. Otherwise, it is derived from the "initial condition request" bit of the control field of received training frames on the correspondent lane of the interface.' to the end of the ic_req definition in 176A.10.3.1.

Proposed Response   *Response Status* **O**

Cl **176A**   *SC* **176A.4.8**   *P* **556**   *L* **37**   # 576

Law, David   HPE

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

176A.4.8 'Coefficient status' says 'The acknowledge reflects the value of coef_sts resulting from the procedure described in 176A.6.3.'. While it is correct that the coef_sts variable is updated by the UPDATE_C(k) function in 176A.6.3, I believe the OUT_OF_SYNC, NEW_INDEX, and WAIT states of the Coefficient update state diagram also update the coef_sts variable. Further, 176A.10.3.2 says that the ENCODE_STS function 'Encodes portions of the status field of transmitted training frames.' and that '... coef_sts is mapped to the coefficient status bits ...'.

SuggestedRemedy

Since calls of the UPDATE_C(k) function and direct updates of the coef_sts variable all occur in the Coefficient update state diagram, suggest that 'The acknowledge reflects the value of coef_sts resulting from the procedure described in 176A.6.3.' in 176A.4.8 should be changed to just read 'The acknowledge reflects the value of coef_sts generated by the Coefficient update state diagram '.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Comment ID* **576**   Page 109 of 118
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   5/3/2024 10:09:29 AM
SORT ORDER: Comment ID

Cl **176A**   *SC* **176A.1**   *P***548**   *L* **12**   # 577

Law, David   HPE

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

The use of the terms 'segment' and 'link' in Annexe 176A, for example in 176A.1 where it says, 'in single-segment or multiple-segment links', are problematic.

IEEE Std 802.3 subclause 1.4.505 'segment' defines it as 'The medium connection, including connectors, between Medium Dependent Interfaces (MDIs) in a CSMA/CD local area network.'. Subclause 1.4.372 'link' defines it as 'The transmission path between any two interfaces of generic cabling. (From ISO/IEC 11801.)'.

As a result, I believe it would only be correct to call an electrical channel between two PMD sublayers a 'segment'. I do not believe that the electrical channel between any other combinations of sublayers is a 'segment'.

SuggestedRemedy

I would suggest 'section' as an alternate to 'segment', but that was used for 'The portion of the link between the PSE Power Interface (PI) and the PD PI.' (see 1.4.378) when PoE had a similar definition problem. Alternatives, therefore, might be 'Division' and 'Sector'.

As another approach, the following is a rewording of 176A.1 to avoid the use of the terms 'segment' and 'link' without the use of a new term. I acknowledge, however, that such an approach would require a significant rewrite of the Annexxe.

The start-up protocol facilitates timing recovery and equalization of the electrical channel between adjacent sublayers, or chains of multiple adjacent sublayers while providing a mechanism through which the receiver can configure the transmitter to optimize performance. The protocol supports these functions through the continuous exchange of fixed-length training frames across the electrical channel between adjacent sublayers and the transport of end-to-end indications across chains of multiple adjacent sublayers.

Proposed Response   *Response Status* **O**

Cl **185**   *SC* **185.5.1**   *P***477**   *L* **12**   # 578

Kota, Kishore   Marvell Semiconductor

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

Minimum transmit power specification has a big impact on coherent module designs. This has been defined in the initial proposals as a specification on the average power following other coherent physical layer specifications defined for DWDM systems. However, there is opportunity for a 800GBASE-LR1 PMD to change this in a way which can relax module transmit specifications

SuggestedRemedy

Define the minimum transmit power specification to be defined per lane instead of average. See https://grouper.ieee.org/groups/802/3/dj/public/23_11/kota_3dj_01a_2311.pdf for an initial proposal based on this concept. Defining the power per lane provides an opportunity to relax lane mismatch specs.

Proposed Response   *Response Status* **O**

Cl **185**   *SC* **185.5.1**   *P***477**   *L* **15**   # 579

Kota, Kishore   Marvell Semiconductor

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

The draft contains separate specifications of X-Y power imbalances and I-Q imbalance. However, there is an opportunity for a 800GBASE-LR1 PMD to change this in a way which can relax module transmit specifications

SuggestedRemedy

Having a separate X-Y and I-Q imbalance specification splits the imbalance power budget and results in a tighter specification than necessary. These specifications should be combined into a single lane-to-lane imbalance specification. See https://grouper.ieee.org/groups/802/3/dj/public/23_11/kota_3dj_01a_2311.pdf for an initial specification methodology proposal.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Comment ID* **579**   Page 110 of 118
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   5/3/2024 10:09:29 AM
SORT ORDER: Comment ID

Cl **185**   *SC* **185.5.2**   *P* **478**   *L* **15**   # 580

Kota, Kishore   Marvell Semiconductor

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

Average receiver power (min) and the per-lane transmit power (min) specifications should
be tied to an appropriate transmit quality metric similar to the TDECQ specifications in
other IMDD clauses

SuggestedRemedy

See https://grouper.ieee.org/groups/802/3/dj/public/24_01/kota_3dj_01a_2401.pdf and
https://grouper.ieee.org/groups/802/3/dj/public/23_11/kota_3dj_01a_2311.pdf for initial
proposals on how to tie the RX sensitivity and TX power specifications with a transmit
quality metric. This provides flexibility to allow module designers to explore design tradeoffs
to simplify designs in ways which can benefit end users.

Proposed Response   *Response Status*   **O**

Cl **00**   *SC* **0**   *P* **0**   *L* **0**   # 581

Brown, Matt   Alphawave Semi

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

In the past, we have included all previously defined AUI for each new PHY type defined.
Given that the PMA multiplexing methods were consistent this was simple to support. Now
that we have switched to a different PMA muttiplexing method (RS-FEC symbol) things are
getting more complicated.

SuggestedRemedy

For each PHY new 200 Gb/s per lane or higher PHY type, include only one or two previous
generations of AUI. Specifically, the new PHY types defined in 802.3dj indication only 100
Gb/s per lane and 200 Gb/s per lane AUIs as being optional within a PHY. Perhaps, also
include 50 Gb/s per lane AUIs as well.

Proposed Response   *Response Status*   **O**

Cl **177**   *SC* **177.4.7.2**   *P* **256**   *L* **13**   # 582

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

Pre-coding was shown on riani_3dj_01a_2303 FECI baseline that when was adopted, and
pre-coding is essential for FECi PMDs

SuggestedRemedy

Please insert text for pre-coder in this sub-clause. as specified in 135.5.7.2, 120.5.7.2, and
173.5.7.2, 6 and 176.9.1.2, that may be enabled or disabled as needed with OLT, without
OLT the optical transmitter should enable 1/(1+D) mod 4 precoding to mitigate burst error.
See Ghiasi/Riani May-24 presentation on the need for pre-coder

Proposed Response   *Response Status*   **O**

Cl **176D**   *SC* **176D.2**   *P* **596**   *L* **32**   # 583

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

Functional block diagram shown for C2C indicate ball-ball specifications

SuggestedRemedy

C2C component should be called C2C device and change the TP0 to TP0d and TP5 to
TP5d

Proposed Response   *Response Status*   **O**

Cl **176D**   *SC* **176D.1**   *P* **595**   *L* **16**   # 584

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

C2C loss is TBD

SuggestedRemedy

Assuming 28 dB budget and package A length ~300 mm and ~125 mm for package B

Proposed Response   *Response Status*   **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
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Cl **179A**   *SC* **179A.4**   *P* **663**   *L* **44**   # 585

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

Host designated losses of 6.5, 11.5, and 16.5 are for TP0d to TP2

SuggestedRemedy

Move the losses to the TP0d to TP2 column
Min host loss is the MCB loss of 2.8 dB
Max loss is dependent on actual package loss and should be removed

Proposed Response   *Response Status*   **O**

Cl **179A**   *SC* **179A.5**   *P* **667**   *L* **32**   # 586

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

MCB via allowance and HCB are TBD

SuggestedRemedy

See Ghiasi C2M May-24 presentation
MCB via = 0.8 dB
HCB=3.8 dB to allow practical implementations

Proposed Response   *Response Status*   **O**

Cl **182**   *SC* **182.7.3.1.1**   *P* **407**   *L* **11**   # 587

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

To support breakout, loopback, and OAN/OLT connectro should be labled

SuggestedRemedy

DR2-2 connector should be labled as Tx1Tx2 ------ Rx2Rx1

Proposed Response   *Response Status*   **O**

Cl **182**   *SC* **182.7.3.1.2**   *P* **407**   *L* **27**   # 588

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

To support breakout, loopback, and OAN/OLT connectro should be labled

SuggestedRemedy

DR2-4 connector should be labled as Tx1Tx2Tx3Tx4 ------ Rx4Rx3Rx2Rx1

Proposed Response   *Response Status*   **O**

Cl **182**   *SC* **182.7.3.1.3**   *P* **408**   *L* **15**   # 589

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

To support breakout, loopback, and OAN/OLT connectro should be labled

SuggestedRemedy

DR2-8 connector should be labled as Tx1Tx2Tx3Tx4Tx5Tx6Tx7Tx8
Rx8Rx7Rx6Rx5Rx4Rx3Rx2Rx1

Proposed Response   *Response Status*   **O**

Cl **180**   *SC* **180.7.3.1.1**   *P* **360**   *L* **11**   # 590

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

To support breakout, loopback, and OAN/OLT connectro should be labled

SuggestedRemedy

DR2-2 connector should be labled as Tx1Tx2 ------ Rx2Rx1

Proposed Response   *Response Status*   **O**

Cl **180**   *SC* **180.7.3.1.2**   *P* **260**   *L* **27**   # 591

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

To support breakout, loopback, and OAN/OLT connectro should be labled

SuggestedRemedy

DR2-4 connector should be labled as Tx1Tx2Tx3Tx4 ------ Rx4Rx3Rx2Rx1

Proposed Response   *Response Status*   **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn
SORT ORDER: Comment ID

Comment ID **591**

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Cl **180**   *SC* **180.7.3.1.3**   *P* **361**   *L* **46**   # 592

Ghiasi, Ali   Ghiasi Quantum/Marvell

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

To support breakout, loopback, and OAN/OLT connectro should be labled

SuggestedRemedy

DR2-8 connector should be labled as Tx1Tx2Tx3Tx4Tx5Tx6Tx7Tx8
Rx8Rx7Rx6Rx5Rx4Rx3Rx2Rx1

Proposed Response   *Response Status* **O**

Cl **176**   *SC* **176.7.1.2.2**   *P* **223**   *L* **52**   # 593

de Koos, Andras   Microchip Technology

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

The 800GBASE-R PCS has 4 FEC engines, so figures 176–16, 176–17, 176–18 should
use C,D to illustrate the symbols on PCSLs 16-31, rather than A',B'. The A',B' notation is
used in 200GBASE-R and 400GBASE-R figures to denote CWs from engines A and B but
with the 2CW delay.

SuggestedRemedy

Ammend Figures 176–16, 176–17, 176–18 to avoid the A',B' notation

Proposed Response   *Response Status* **O**

Cl **176**   *SC* **176.5.1.3.1**   *P* **201**   *L* **24**   # 594

de Koos, Andras   Microchip Technology

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

Functionally, is there anything preventing the SM-PMAs from performing a full deskew
instead of only to 20/40-bit boundaries?
A full deskew at the SM-PMA would NOT change end-to-end latency, since the skew is all
untimately undone at the Rx PCS.
Keeping the PMA as light as possible (less buffering required) is OK, but if an
implementation chooses to do so, performing a full deskew (i.e. to AMs, or CW boundaries)
should be allowed for both Rx and Tx.

SuggestedRemedy

Add the following note the 20/40 bit deskew clauses (176.5.1.3.1, 176.6.1.2.1, 176.7.1.2.1,
176.8.1.2.1):
Full deskew (to AM boudaries) of PCSLs may optioanlly be performed by the SM-PMA
transmit function.

Proposed Response   *Response Status* **O**

Cl **176**   *SC* **176.5.1.4.2**   *P* **204**   *L* **42**   # 595

de Koos, Andras   Microchip Technology

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

Is there anything preventing an implementation from performing a full deskew at the Rx
PMA? It is not technically required, but does not cause any adverse functional effects.
A full deskew at the Rx SM-PMA would NOT change end-to-end latency, since the skew is
all untimately undone at the Rx PCS. A deskew upstream would simply offload the deskew
from the Rx PCS.
Implementations with a SM-PMA attached to an RxPCS will undoubtedly perform the
Alignment marker lock only once (not once in the PMA and again in the PCS). AM-lock plus
deskew is a very natural coupling of functions.

SuggestedRemedy

Consider adding the following note to the Rx Alignment marker lock clauses (176.5.1.4.2,
176.6.1.3.2, 176.7.1.3.2, 176.8.1.3.2):
After the Alignment Marker lock, no deskew of the PCSLs is required. However, deskewing
the PCSLs before the would not have and adverse functional effects.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Comment ID* **595**   Page 113 of 118
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   5/3/2024 10:09:29 AM
SORT ORDER: Comment ID

Cl **176** *SC* **176.5.1.3.1** *P* **201** *L* **24** # 596

de Koos, Andras   Microchip Technology

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

In the AM lock and deskew clauses, is a full deskew not necessary? The goal of the Clause 176 PMA, if I understand correctly, is that at the output lane(s), each set of 4 consecutive 10-bit symbols must come from 4 different RS-FEC codewords. In the current draft, this is not achieved.

Without skew, everything works because the symbol delay is in the same direction as the FEC CW delay. But with n*20b of skew, where some odd PCSLs arrive before even PCSLs, after the 10bit delay on odd PCSLs, (Clause 176.5.1.3.4) and the 2 CW delay (Clause 176.5.1.3.4), there will still be a period of overlap where symbols from the same FEC codeword appear at the same time. Symbols from the same RS_FEC CW can thus appear within 2 symbols after the output mux.

Before skew (showing boundary between FEC words 1 and 2):
PCSL0:   B2 A2 B1 A1 B1 A1
PCSL1:   A2 B2 A1 B1 A1 B1

20-bit skew : PCSL1 arrives before PCSL0 (when PCSL0 is finishing A1/B1, PCSL1 has already started A2/B2)
PCSL0:   B2 A2 B1 A1 B1 A1
PCSL1:   A2 B2 A1 B1 A1 B1

10-bit delay on odd lane (Clause 176.5.1.3.4):
PCSL0:   B2 A2 B1 A1 B1 A1
PCSL1:   A2 B2 A1 B1 A1 B1

2 FEC CW delay on odd lane (Clause 176.5.1.3.4):
PCSL0:   B2 A2 B1 A1 B1 A1
PCSL1:   A1 B1 A0 B0 A0 B0
-> B1s line up on PCSL 0 and 1 for one 8:1 two-symbol mux cycle.

with more than 20 bits of skew, there will be more "codeword overlap".

Adding a "full deskew" may not be too costly.
Or, is this potential overlap due to skew understood and planned for in the AUI/PMD loss budgets?

SuggestedRemedy

Consider requiring a full deskew instead of the 20/40 bit deskew in clauses (176.5.1.3.1, 176.6.1.2.1, 176.7.1.2.1, 176.8.1.2.1).

Proposed Response   *Response Status* **O**

Cl **176** *SC* **176** *P* **195** *L* **1** # 597

de Koos, Andras   Microchip Technology

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

Has any thought been put into how to calculate the path data delay values (MII-MDI latencies for timestamping) for the SM-PMAs? For bit-mux PMAs, it is very simple - i.e. it is all implementation delay, since the intrinsic delay from bit muxing/demultiplexing is negligible. But at first glance, determining the latency across the Clause 176 PMA looks like more of a challenge.
  a. I don't believe that the intrinsic (i.e. non-implementation) delay is deterministic, due to the partial deskew.
  b. But apart from the partial deskew, the latency across the SM-PMA should be deterministic using the principles in Annex 90A.7 (max latency value used for Tx path data delay, min latency value used for Rx path data delay).
  c. Traditionally, how to calculate the delays through the PHY layers has been an implementation concern, but this is because the calculation was straightforward at lower rates. At 200Gbps lanes, the standard does not have the luxury of being able to ignore this. If it is overly complicated or ambiguous, and opposite ends of a link do not implement it in the same fashion, the system Time Synchronization will be impaired.

SuggestedRemedy

Consider a note in Clause 176 (or next to the PMA path data delay MDIO registers - 45.2.1.176, 45.2.1.177) that the path data delay values for the SM-PMA should be calculated via the method in Annex 90A.7.
I don't think it is necessary, but if a more detailed explanation is deemed useful, then a subclause could be added to Clause 90.7 spelling out explicitly how the path data delay values should be calculated for the SM-PMA.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   *Comment ID* **597**   Page 114 of 118
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   5/3/2024 10:09:29 AM
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Cl **176**   *SC* **176.5.1.3.1**   *P* **201**   *L* **24**   # 598

de Koos, Andras   Microchip Technology

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

Skew in series within the PHY sub-layers may not have deterministic sum, making accurate path data delay calculation impossible. See Annex 90A.6 for a more detailed explanation. Towards the MDI, the transmit SM-PMA function should thus have the option to undo any skew introduced by the Tx PCS layer and AUI links. (i.e. do a full de-skew).

In the Rx direction, the same problem exists. If the SM-PMA does not do a full deskew, then the remaining skew, in series with skew from other layers in the PHY (from AUIs, for example) and from the medium, will have a non-deterministic sum.

Adding an option for the SM-PMA to do a full deskew (not just a 20/40-bit deskew) would be a way to allow implementations to avoid the TimeSync impairment due to skew between the PHY layers.

This is a lot to digest - I can present the reasoning here if leadership thinks it would be worthwhile.

SuggestedRemedy

Consider requiring (or allowing as an option) a full deskew instead of the 20/40 bit deskew in clauses (176.5.1.3.1, 176.6.1.2.1, 176.7.1.2.1, 176.8.1.2.1).

Proposed Response   *Response Status* **O**

Cl **176**   *SC* **176.5.1.3.4**   *P* **202**   *L* **48**   # 599

de Koos, Andras   Microchip Technology

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

The SM-PMA adds a lot of latency due to the 2x RS-FEC CW delay in the 8:1 and 16:2 SM-PMAs, as compared to the bit-mux PMAs

For setups with an MII-Extender it is actually worse, since the penalty would also exist between the DTE_XS and PHY_XS. If latency is a concern, it actually becomes preferable to use 100Gbps links for the DTE_XS <-> PHY_XS AUI interface, negating the advantages of 200Gbps links!

The latency penalty for the 8:1 and 16:2 PMAs should be noted in Clauses 176.5.1.3.4 and 176.6.1.2.4.

SuggestedRemedy

Add the following note to the 2xFEC CW delay sub-clauses (176.5.1.3.4 and 176.6.1.2.4):
Note that the delay added to the odd PCSLs (and to the even PCSLs at the far-end) causes an end-to-end latency increase of 51.4ns as compared to BM-PMAs.

Proposed Response   *Response Status* **O**

Cl **176**   *SC* **176.6**   *P* **213**   *L* **1**   # 600

de Koos, Andras   Microchip Technology

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

Would it not be possible to merge Clause 176.5 and 176.6? They are 95% similar, so repeating everything is hardly necessary.
Even the figures for 200GBASE-R SM-PMA (Figure 176–3, Figure 176–4, Figure 176–5) have a general form with a variable number of PCSLs that are suitable for 400GBASE-R

SuggestedRemedy

Consider merging subclauses 176.5 and 176.6

Proposed Response   *Response Status* **O**

Cl **176**   *SC* **176.5.2**   *P* **208**   *L* **40**   # 601

de Koos, Andras   Microchip Technology

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

Is specifying the 1:8 SM-PMA really necessary? Apart from the layers it attaches to and the labels on the interfaces, it is identical to the 8:1 PMA. Same thing for 16:2 vs 2:16 for 400G, 32:4 vs 4:32 for 800G, and 16:8 vs 8:16 for 1.6T.
Alternately, could SM-PMAs be specified unidirectionally, rather than specifying transmit and receive? So 8:1 would only specify the PCS-PMD direction, and 1:8 would specify the PMD-PCS direction.
Having so many sub-clauses that just point to other sub-clauses is an easy way to cause confusion.

SuggestedRemedy

Consider specifying the 1:8 and 8:1 (and equivalent SM-PMAs for other rates) together.

Proposed Response   *Response Status* **O**

Cl **176**   *SC* **176.6.1**   *P* **213**   *L* **4**   # 602

de Koos, Andras   Microchip Technology

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

Clauses 176.6, 176.7 and 176.8 are missing the 'overview' sub-clauses (with tables) that exist in Clause 176.5 (e.g. 176.5.1.1). The equivalent content is there but is placed directly in each PMA sub-clause (e.g. 176.6.1)

SuggestedRemedy

Structure the subclauses consistently between 200GBASE-R and 400GBASE-R, 800GBASE-R, 1.6TBASE-R.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
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Comment ID **602**

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Cl **45**　　*SC* **45**　　　　　*P* **57**　　*L* **1**　　　# 603

de Koos, Andras　　　　　　　Microchip Technology

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

Inner FEC (Clause 177 or Clause 184) needs MDIO registers for TimeSync. They should look like the PMA/PMD clause registers.

SuggestedRemedy

Add the following MDIO registers for the Inner FEC, in the same style as the equivalent PMA/PMD MDIO registers
- TimeSync capability
- TimeSync transmit path data delay register
- TimeSync receive path data delay register

Proposed Response　　　*Response Status* **O**

Cl **177**　　*SC* **177.4.6**　　　*P* **254**　　*L* **31**　　　# 604

de Koos, Andras　　　　　　　Microchip Technology

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

Phase of inner FEC pad bits vs outer FEC parity bits:
- An inaccuracy in the path data delay of up to 12ps due to arbitrary phase between the output FEC parity bits and the inner FEC pad bits of the phase is not accounted for.
- This arbirtary phase would affect the path data delay values.
- Almost negligible, if my math is correct.

SuggestedRemedy

3 possible ways to address:
a. Impose a phase relationship between the RS FEC code word boundaries and the inner FEC pad bits, which would mean large-scale changes to the draft.
b. Specify (in clause 90, perhaps) that the path data delay contribution through the inner FEC sublayer shall be strictly additive to the path data delay contribution through the PCS and PMA layers.
c. Ignore. Based on 90A.7, the effect here is small enough to not address specifically.
"Whether the potential delay difference between the aggregated delay and the sum of the individual function delays is small enough to satisfy the timing requirements is up to the individual application."
I prefer option (c). It should not be necessary to add specific text or impose new logical rules to the Inner FEC pad bits to address a potential 12ps path data delay impairment.

Proposed Response　　　*Response Status* **O**

Cl **177**　　*SC* **177.4.1**　　　*P* **251**　　*L* **36**　　　# 605

de Koos, Andras　　　　　　　Microchip Technology

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

Due primarily to the convolutional interleaver/deinterleaver, there is a large variation in the input-to-output latency of the Inner FEC sublayer. As such, there is concern that the method to properly calculate the path data delay for the Inner FEC sublayer should be explained in Clause 90, similarly to what is done for the variation from FEC codewords and PCS-lane distribution in clause 90.7.1.

SuggestedRemedy

Do nothing.
Using the general method in Clause 90A, allocating the maximum value of the intrinsic delay to the transmit PHY and the minimum value of the intrinsic delay to the receive PHY, there is no ambiguity.
So it should not be necessary to add to Clause 90 for every new PHY type. The principles laid out in Annex 90A.7 should apply.
If anything, a general note could be added in Clause 177 (or in Clause 45 with the MDIO registers for path data delay values) explaining that the Tx/Rx path data delay values should be calculated following the guidelines in Annex 90A.7, where the maximum latency value is used for the Tx path data delay, and the minimum latency value is used for Rx path data delay.

Proposed Response　　　*Response Status* **O**

Cl **177**　　*SC* **177.4.3**　　　*P* **252**　　*L* **37**　　　# 606

de Koos, Andras　　　　　　　Microchip Technology

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

I'm not convinced that the circular shift really adds any robustness. Yes, it distances bit-pairs belonging to the same RS-FEC codeword, but…
Without the shift, the consecutive bit pairs (after 8:1 multiplexing) belonging to the same RS-FEC code words would each protected by different Inner FEC code words, would they not?
So is the circular shift just protecting against uncorrected inner-FEC codewords that would all land on the same RS-FEC codeword? Seems overkill. Are there simulations/models showing the benefit of including circular shift?

SuggestedRemedy

Consider removing the circular shift if it does not offer any worthwhile benefit.

Proposed Response　　　*Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
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Comment ID **606**　　　Page 116 of 118
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Cl **177**   *SC* **177.4.3**   *P* **252**   *L* **37**   # 607

de Koos, Andras   Microchip Technology

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

Was there not a proposal to make the circular shift optional, in order to minimize latency?

SuggestedRemedy

Consider removing the circular shift if it does offer not any worthwhile benefit.

Proposed Response   *Response Status* **O**

Cl **177**   *SC* **177.4.6**   *P* **254**   *L*   # 608

de Koos, Andras   Microchip Technology

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

A figure illustrating the pad bits and their interval for each inner FEC flow would be useful. I always find myself referring to the equivalent RS-FEC Figures (Figure 119–6 and Figure 119–8)

SuggestedRemedy

Consider adding a figure illustrating the pad insertion and interval, in the same style as Figure 119-6

Proposed Response   *Response Status* **O**

Cl **177**   *SC* **177.5.1**   *P* **257**   *L* **1**   # 609

de Koos, Andras   Microchip Technology

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

A figure illustrating the possible one bit-pair of skew and the relationship to the Inner FEC flows would be very helpful here. I only understand because I recall the Task Force presentations!

SuggestedRemedy

Consider adding a figure illustrating how the position of the 1 bit-pair of skew determines the Inner FEC flow number.

Proposed Response   *Response Status* **O**

Cl **177**   *SC* **177.4.1**   *P* **251**   *L* **50**   # 610

Huang, Kechao   Huawei Technologies Co., Ltd.

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

"The convolutional interleaver is composed of 3 delay lines where the first delays the PHYs data by eight
RS-FEC codewords, the second by four RS-FEC codewords and the last adds no delay" is correct only if the Q values are 544/272/136/68 for 200G/400G/800G/1.6T. However, the Q values should be 192/96/48/24 as shown in slides 6-11 of he_3dj_01_2307 for 200G/400G/800G/1.6TbE.

SuggestedRemedy

Suggest to modify Line 50-51 in page 251 as follows:
The convolutional interleaver is composed of three parallel delay lines (numbered 0 to 2), as illustrated in Figure 177–3. Each delay operator "D" represents a storage element of 40 bits. From one delay line to the next higher delay line, Q delay operators are deleted.
Modify the Q values to 192/96/48/24 for 200G/400G/800G/1.6T

Proposed Response   *Response Status* **O**

Cl **177**   *SC* **177.4.4**   *P* **253**   *L* **48**   # 611

Huang, Kechao   Huawei Technologies Co., Ltd.

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

The systematic Hamming code is most naturally defined in terms of its parity-check matrix, as pointed out in many textbooks and standard documents. One famous example is the systematic double-extended Hamming(128,119) code in OIF-400ZR and ITU-T G.709.3.

SuggestedRemedy

Suggest to include the construction process and parity-check matrix of the adopted Hamming(68,60) code to enhance the completeness of the document. A Supporting Presentation will be provided.

Proposed Response   *Response Status* **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general
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Comment ID **611**   Page 117 of 118
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Cl **177**   *SC* **177.4.4**   *P* **253**   *L* **48**   # 612

Huang, Kechao   Huawei Technologies Co., Ltd.

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

"The generation matrix G(60,8) for the Hamming(68,60) encoder is given in
Table 177–1" is not accurate. The generation matrix for the Hamming(68,60) should be with
60 rows and 68 columns, where the most-left 60 columns is the indentity matrix.

SuggestedRemedy

Suggest to change the sentence to "The generator matrix of the Hamming(68,60) code is
G=[I_60 ; G_(60×8)],where I_60 is the 60×60 identity matrix, and G_(60×8) is a 60×8
matrix used to generate the 8 parity bits given in
Table 177–1."

Proposed Response   *Response Status*   **O**

Cl **184**   *SC* **184.4.4**   *P* **448**   *L* **5**   # 613

Huang, Kechao   Huawei Technologies Co., Ltd.

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

For permo[p, 40x(i-18x i mod 3)+j], the column index 40x(i-18x i mod 3)+j may be a
negative value

SuggestedRemedy

Suggest to add one sentence after Line 9: When 40x(i-18x i mod 3)+j is negative, permo[p,
40x(i-18x i mod 3)+j] will be undetermined value from initial buffer of the convolutional
interleaver.

Proposed Response   *Response Status*   **O**

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general   Comment ID **613**   Page 118 of 118
COMMENT STATUS: D/dispatched A/accepted R/rejected   RESPONSE STATUS: O/open W/written C/closed Z/withdrawn   5/3/2024 10:09:29 AM
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