

IEEE P802.3cz D3.01 Multi-Gigabit Optical Automotive Ethernet Initial Sponsor ballot comments

Cl **FM** SC **FM** P1 L11 # **I-7**

Grow, Robert KDPOF,RMG Consulting  
 Comment Type **G** Comment Status **A** Title

When looking at the title in a large font it is really too long. We should work with staff to come up with an acceptable title that is in compliance with IEEE SA rules (within the scope of the PAR) but shorter. A modified version could also be adapted for P802.3dh.

The document title occurs on: title page, the boxed paragraph of the front matter introduction on page 10, and internal title on page 21. All should be consistent, either exactly matching the PAR Title, or within the scope as required by SASB Ops Man, 4.2.3.2.

*SuggestedRemedy*

One possible alternate amendment title is: "Physical Layer Specifications and Management Parameters for Multi-Gigabit Automotive Ethernet Using Glass Optical fiber". Another alternative is: "Physical Layer Specifications and Management Parameters for Multi-Gigabit Glass Fiber Optical Automotive Ethernet" (closer to P802.3cy title structure)

Response Response Status **C**

ACCEPT IN PRINCIPLE.  
 Page 1 line 11,  
 Page 21 line 10,  
 Page 10 line 4 (boxed paragraph):  
 Change " Physical Layer Specifications and Management Parameters for Multi-Gigabit Optical Ethernet Using Graded-Index Glass Optical Fiber for Application in the Automotive Environment"  
 to: "Physical Layer Specifications and Management Parameters for Multi-Gigabit Glass Optical Fiber Automotive Ethernet"

Cl **FM** SC **FM** P1 L31 # **I-6**

Grow, Robert KDPOF,RMG Consulting  
 Comment Type **E** Comment Status **A** PAR synch

Minor grammar problem that could be fixed when updating paragraph for the next draft.

*SuggestedRemedy*

Change "add a new Physical Layer specifications" to "add new Physical Layer specifications".

Response Response Status **C**

ACCEPT IN PRINCIPLE.

See #i-109 response as copied below:

Change "The purpose of the amendment is to add a new Physical Layer specifications and Management Parameters for"  
 to  
 "This amendment adds Physical Layer specifications and management parameters for"

Cl **FM** SC **FM** P1 L32 # **I-109**

Dawe, Piers J G NVIDIA  
 Comment Type **E** Comment Status **A** PAR synch

This says "The purpose of the amendment is to add a new Physical Layer specifications and Management Parameters for" and on the next page the abstract says "This amendment to IEEE Std 802.3-2022 adds physical layer specifications and management parameters for". 802.3db says "This amendment adds Physical Layer specifications and management parameters for", 802.3ck says "This amendment includes Physical Layer specifications and management parameters for"

*SuggestedRemedy*

Simplify and follow house style, align with self-description on page 12. Remove capitals from "Management Parameters". e.g. "This amendment adds Physical Layer specifications and management parameters for"

Response Response Status **C**

ACCEPT IN PRINCIPLE.  
 Change "The purpose of the amendment is to add a new Physical Layer specifications and Management Parameters for"  
 to  
 "This amendment adds Physical Layer specifications and management parameters for"

Cl **FM** SC **FM** P1 L33 # **I-12**

Torres, Luis Knowledge Development for Plastic Optical Fiber  
 Comment Type **E** Comment Status **A** PAR synch

The draft document description should include the type of fiber specified in PAR.

*SuggestedRemedy*

Add "using graded-index glass optical fiber" after "Automotive Ethernet"

Response Response Status **C**

ACCEPT.

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<b>CI FM</b>	<b>SC FM</b>	<b>P2</b>	<b>L2</b>	#	<b>I-13</b>
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Torres, Luis Knowledge Development for Plastic Optical Fiber

**Comment Type E Comment Status A PAR synch**

The abstract should include the type of fiber specified in PAR.

**SuggestedRemedy**  
Substitute "optical fiber" with "graded-index glass optical fiber"

**Response Response Status C**  
ACCEPT IN PRINCIPLE.  
Change  
"optical fiber for use in automotive applications"  
to  
"glass optical fiber in the automotive environment"

<b>CI FM</b>	<b>SC FM</b>	<b>P12</b>	<b>L14</b>	#	<b>I-21</b>
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Wienckowski, Natalie General Motors Company

**Comment Type E Comment Status A Editorial scope**

The correct expansion of PMA is Physical Medium Attachment per 802.3-2022 1.5.

**SuggestedRemedy**  
Change: Physical Media Attachment (PMA)  
To: Physical Medium Attachment (PMA)

**Response Response Status C**  
ACCEPT.

<b>CI FM</b>	<b>SC FM</b>	<b>P21</b>	<b>L10</b>	#	<b>I-117</b>
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Dawe, Piers J G NVIDIA

**Comment Type E Comment Status A Title**

Management, Optical Bad hyphenation. 802.3db and 802.3ck don't split "Management". These could be better hyphenated as Management, Optical, but better still not hyphenated. The very large text means that there is room for only about 42 characters per line, which is inconvenient with 10-character words.

**SuggestedRemedy**  
Stop these words being split here. Ask staff to reduce this font size by about 10%

**Response Response Status C**  
ACCEPT IN PRINCIPLE.  
Change " Physical Layer Specifications and Management Parameters for Multi-Gigabit Optical Ethernet Using Graded-Index Glass Optical Fiber for Application in the Automotive Environment"  
to: "Physical Layer Specifications and Management Parameters for Multi-Gigabit Glass Optical Fiber Automotive Ethernet"

<b>CI 0</b>	<b>SC 0</b>	<b>P21</b>	<b>L0</b>	#	<b>I-1</b>
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Turner, Michelle Editorial Coordination

**Comment Type E Comment Status A Title**

The title on page 21 and in the introduction box is different from what is cited on page 1.

**SuggestedRemedy**  
It should be reconciled to match what is on page 1 as per the modified PAR.

**Response Response Status C**  
ACCEPT IN PRINCIPLE.

Page 1 line 11,  
Page 21 line 10,  
Page 10 line 4 (boxed paragraph):

Change: "Physical Layer Specifications and Management Parameters for Multi-Gigabit Optical Automotive Etherne  
to "Physical Layer Specifications and Management Parameters for Multi-Gigabit Glass Optical Fiber Automotive Ethernet".

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Cl 1 SC 1.4.62a P22 L15 # I-118

Dawe, Piers J G NVIDIA  
 Comment Type E Comment Status A EZ -Pull to discuss

Phrase with adjectives and no noun

SuggestedRemedy

Change "for a 10 Gb/s Ethernet full duplex over" to "for a 10 Gb/s full duplex Ethernet over" or "for 10 Gb/s full duplex over".  
 Similarly in 1.4.95a, 1.4.116a and 1.4.165a.

Response Response Status C

ACCEPT IN PRINCIPLE.  
 Page 22 Line 15  
 Change "for a 10 Gb/s Ethernet full duplex over" to "for 10 Gb/s full duplex Ethernet operation over"  
 Page 22 Line 21  
 Change "for a 2.5 Gb/s Ethernet full duplex over" to "for 2.5 Gb/s full duplex Ethernet operation over"  
 Page 22 Line 25  
 Change "for a 25 Gb/s Ethernet full duplex over" to "for 25 Gb/s full duplex Ethernet operation over"  
 Page 22 Line 31  
 Change "for a 50 Gb/s Ethernet full duplex over" to "for 50 Gb/s full duplex Ethernet operation over"  
 Page 22 Line 36  
 Change "for a 5 Gb/s Ethernet full duplex over" to "for 5 Gb/s full duplex Ethernet operation over"

Cl 1 SC 1.4.62a P22 L15 # I-119

Dawe, Piers J G NVIDIA  
 Comment Type E Comment Status R Full duplex

As 44.1.1 and 125.1.1 say, 2.5 Gigabit, 5 Gigabit and 10 Gigabit Ethernet are defined for full duplex mode of operation only. So no need to say it here; there are plenty of Physical Layer definitions that don't.

SuggestedRemedy

Delete "full duplex", four times.

Response Response Status C

REJECT.  
 Definitions should contain as much relevant information as possible.  
 i.e, the application of i.e. Annex 4A depends on the definition of these PHYs as full duplex.

Cl 1 SC 1.4.62a P22 L17 # I-24

Wienckowski, Natalie General Motors Company  
 Comment Type T Comment Status A PAR synch

P802.3cz split off P802.3dh. In doing this, the P802.3cz objectives were modified to specify glass optical fiber as plastic optical fiber is covered by dh.

SuggestedRemedy

Change: multimode optical fiber for use in automotive applications.  
 To: multimode glass optical fiber for use in automotive applications.

Response Response Status C

ACCEPT IN PRINCIPLE.  
 Change  
 "optical fiber for use in automotive applications"  
 to  
 "glass optical fiber in the automotive environment"

Cl 1 SC 1.4.95a P22 L22 # I-25

Wienckowski, Natalie General Motors Company  
 Comment Type T Comment Status A PAR synch

P802.3cz split off P802.3dh. In doing this, the P802.3cz objectives were modified to specify glass optical fiber as plastic optical fiber is covered by dh.

SuggestedRemedy

Change: multimode optical fiber for use in automotive applications.  
 To: multimode glass optical fiber for use in automotive applications.

Response Response Status C

ACCEPT IN PRINCIPLE.  
 Change  
 "optical fiber for use in automotive applications"  
 to  
 "glass optical fiber in the automotive environment"

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Cl 1 SC 1.4.116a P22 L27 # I-26

Wienckowski, Natalie General Motors Company

Comment Type T Comment Status A PAR synch

P802.3cz split off P802.3dh. In doing this, the P802.3cz objectives were modified to specify glass optical fiber as plastic optical fiber is covered by dh.

SuggestedRemedy

Change: multimode optical fiber for use in automotive applications.  
To: multimode glass optical fiber for use in automotive applications.

Response Response Status C

ACCEPT IN PRINCIPLE.  
Change  
"optical fiber for use in automotive applications"  
to  
"glass optical fiber in the automotive environment"

Cl 1 SC 1.4.165a P22 L32 # I-27

Wienckowski, Natalie General Motors Company

Comment Type T Comment Status A PAR synch

P802.3cz split off P802.3dh. In doing this, the P802.3cz objectives were modified to specify glass optical fiber as plastic optical fiber is covered by dh.

SuggestedRemedy

Change: multimode optical fiber for use in automotive applications.  
To: multimode glass optical fiber for use in automotive applications.

Response Response Status C

ACCEPT IN PRINCIPLE.  
Change  
"optical fiber for use in automotive applications"  
to  
"glass optical fiber in the automotive environment"

Cl 1 SC 1.4.178a P22 L37 # I-28

Wienckowski, Natalie General Motors Company

Comment Type T Comment Status A PAR synch

P802.3cz split off P802.3dh. In doing this, the P802.3cz objectives were modified to specify glass optical fiber as plastic optical fiber is covered by dh.

SuggestedRemedy

Change: multimode optical fiber for use in automotive applications.  
To: multimode glass optical fiber for use in automotive applications.

Response Response Status C

ACCEPT IN PRINCIPLE.  
Change  
"optical fiber for use in automotive applications"  
to  
"glass optical fiber in the automotive environment"

Cl 1 SC 1.4.204a P22 L42 # I-29

Wienckowski, Natalie General Motors Company

Comment Type T Comment Status A PAR synch

P802.3cz split off P802.3dh. In doing this, the P802.3cz objectives were modified to specify glass optical fiber as plastic optical fiber is covered by dh.

SuggestedRemedy

Change: operation over optical fiber in the automotive environment  
To: operation over glass optical fiber in the automotive environment

Response Response Status C

ACCEPT IN PRINCIPLE.  
Change  
"optical fiber for use in automotive applications"  
to  
"glass optical fiber in the automotive environment"

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**Cl 30**    **SC 30.5.1.1.2**    **P24**    **L40**    # **I-30**  
 Wienckowski, Natalie    General Motors Company  
*Comment Type*    **T**    *Comment Status*    **A**    *PAR synch*  
 P802.3cz split off P802.3dh. In doing this, the P802.3cz objectives were modified to specify glass optical fiber as plastic optical fiber is covered by dh.  
*SuggestedRemedy*  
 Change: Optical fiber PHY as specified in Clause 166.  
 To: Glass optical fiber PHY as specified in Clause 166.  
 Also P24L45, P24L49, P24L54, and P25L4.  
*Response*    *Response Status*    **C**  
 ACCEPT.

**Cl 44**    **SC 44.1.4.4**    **P28**    **L47**    # **I-120**  
 Dawe, Piers J G    NVIDIA  
*Comment Type*    **E**    *Comment Status*    **A**    *PAR synch*  
 This could be better aligned to the project title in the PAR, which says "for application in the automotive environment". See similar comments to other "introduction to" clauses.  
*SuggestedRemedy*  
 Change "for automotive applications" to "for application in the automotive environment" or possibly "in the automotive environment".  
*Response*    *Response Status*    **C**  
 ACCEPT IN PRINCIPLE.  
 Change to "glass optical fiber in the automotive environment".

**Cl 44**    **SC 44.1.4.4**    **P28**    **L48**    # **I-32**  
 Wienckowski, Natalie    General Motors Company  
*Comment Type*    **T**    *Comment Status*    **A**    *PAR synch*  
 P802.3cz split off P802.3dh. In doing this, the P802.3cz objectives were modified to specify glass optical fiber as plastic optical fiber is covered by dh.  
*SuggestedRemedy*  
 Change: transmission on optical fiber for automotive applications.  
 To: transmission on glass optical fiber for automotive applications.  
*Response*    *Response Status*    **C**  
 ACCEPT IN PRINCIPLE.  
 Change to "glass optical fiber in the automotive environment"

**Cl 45**    **SC 45.2.1.158a.1**    **P32**    **L23**    # **I-36**  
 Wienckowski, Natalie    General Motors Company  
*Comment Type*    **E**    *Comment Status*    **A**    *Number writing*  
 When talking about the value of combinations of bits in a register, just the "01" stream is used. "0b" is not put before this. For an example, see 45.2.1.214.2.  
*SuggestedRemedy*  
 Change 0b0000 to 0000  
 P32L24: Change 0b0001 to 0001  
 P32L24: Change 0b0010 to 0010  
 P32L25: Change 0b0011 to 0011  
 P32L26: Change 0b0100 to 0100  
*Response*    *Response Status*    **C**

ACCEPT IN PRINCIPLE.  
 P32L23: Change 0b0000 to 0000  
 P32L24: Change 0b0001 to 0001  
 P32L24: Change 0b0010 to 0010  
 P32L25: Change 0b0011 to 0011  
 P32L26: Change 0b0100 to 0100

**Cl 45**    **SC 45.2.1.158a.1**    **P33**    **L22**    # **I-121**  
 Dawe, Piers J G    NVIDIA  
*Comment Type*    **ER**    *Comment Status*    **A**    *Number writing*  
 There are very many bit-based registers in Clause 45 in the base document, and "0b" never appears there. It is clear from the descriptions and contexts that they are bits. "0b0000" is not well defined in 802.3 and not normal notation. b means 11 in hex, as in 115A.1 for example, same as B does. This is a 4-bit field as the text makes clear, so a 6-digit value makes no sense anyway.  
 These subclauses 45.2.1.158a BASE-AU PMA/PMD control register (1.901) and 45.2.1.158a.1 Type selection (1.901.3:0) should be precisely aligned to 45.2.1.158 BASE-H PMA/PMD control register (Register 1.900) and 45.2.1.158.1, Type selection (1.900.3:0). Similarly, 45.2.3.90.1 Operation mode (3.2348.15:13) should be precisely aligned to 45.2.3.53.1 Operation mode (3.518.15:13).  
*SuggestedRemedy*  
 Change 0b0000 to 0000, 0b0001 to 0001, 0b000, to "binary 000", and so on to match the base document.  
*Response*    *Response Status*    **U**  
 ACCEPT IN PRINCIPLE.  
 Make the change and search for "0b" and substitute with "binary"

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Cl 45 SC 45.2.3.90.1 P37 L4 # I-38  
 Wienckowski, Natalie General Motors Company  
 Comment Type E Comment Status A Number writing  
 Don't use "0b" before binary bit values.  
 SuggestedRemedy  
 Change: 0b000 to 000.  
 Response Response Status C  
 ACCEPT.

Cl 45 SC 45.2.3.90.2 P37 L10 # I-39  
 Wienckowski, Natalie General Motors Company  
 Comment Type E Comment Status A Number writing  
 Don't use "0b" before binary bit values.  
 SuggestedRemedy  
 Change: 0b000 to 000  
 Response Response Status C  
 ACCEPT.

Cl 45 SC 45.2.3.90.2 P37 L11 # I-40  
 Wienckowski, Natalie General Motors Company  
 Comment Type E Comment Status A Number writing  
 Don't use "0b" before binary bit values.  
 SuggestedRemedy  
 Change: 0b000 to 000  
 Response Response Status C  
 ACCEPT.

Cl 45 SC 45.2.3.91.12 P39 L38 # I-11  
 Rannow, R K Representing myself  
 Comment Type TR Comment Status A EEE  
 Ambiguous and inconsistent termination used throughout the document. This is just one example:  
 When read as one, bit 3.2349.2 indicates both that the remote PHY has the EEE ability and that the EEE advertisement is enabled. When read as zero,  
 SuggestedRemedy  
 Check all instances and confirm consistency and remove ambiguity.

When read as a one, bit 3.2349.2 indicates that the remote PHY has the EEE ability and that the EEE advertisement is enabled. When read as a zero, ..  
 Multiple instances on inconsistency. Add "a" as necessary for consistency and correctness.  
 Response Response Status U  
 ACCEPT IN PRINCIPLE.  
 Page 39 line 18: Substitute "read as one" with "read as a one". Substitute "read as zero" with "read as a zero".  
 Page 39 line 30: Substitute "read as one" with "read as a one". Remove "both".  
 Page 39 line 31: Substitute "read as zero" with "read as a zero".  
 Page 39 line 38: Substitute "read as one" with "read as a one". Remove "both".  
 Page 39 line 39: Substitute "read as zero" with "read as a zero".  
 Page 39 line 44: Substitute "read as one" with "read as a one".  
 Page 39 line 45: Substitute "read as zero" with "read as a zero".  
 Page 40 line 3: Substitute "read as one" with "read as a one".  
 Page 40 line 4: Substitute "read as zero" with "read as a zero".

Cl 45 SC 45.5.3.6 P43 L25 # I-41  
 Wienckowski, Natalie General Motors Company  
 Comment Type E Comment Status A Number writing  
 Don't use "0b" before binary bit values.  
 SuggestedRemedy  
 Change: 0b000 to 000  
 Response Response Status C  
 ACCEPT.

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Cl 45 SC 45.5.3.6 P43 L35 # [REDACTED]  
 Wienckowski, Natalie General Motors Company  
 Comment Type E Comment Status A Number writing  
 Don't use "0b" before binary bit values.  
 SuggestedRemedy  
 Change: 0b000 to 000  
 Response Response Status C  
 ACCEPT.

Cl 66 SC 66.4.1 P103 L40 # [REDACTED]  
 Mcclellan, Brett Marvell Semiconductor, Inc.  
 Comment Type TR Comment Status R EEE  
 The current definition of PHD.CAP.LPI does not preclude dynamic changing between 1 and 0. I don't believe this could actually work with dynamic changes while the link is up.  
 SuggestedRemedy  
 on page 103 line 40 insert the following text "The value of PHD.CAP.LPI shall not change."  
 Response Response Status U  
 REJECT.

The issue raised by the author of the comment is already covered by the current draft version.

In page 69, line 10:

"PHD.CAP.LPI is used by the PHY to advertise that Energy-Efficient Ethernet (EEE) is supported and that it is enabled."

In subclause 45.2.3.90.4 it is stated:

"Setting bit 3.2348.0 to one shall enable the advertisement of local PHY EEE ability (see 166.4). Setting bit 3.2348.0 to zero shall prevent establishment of EEE operation with the link partner. If the BASE-U PHY does not have EEE ability (bit 3.2349.0 = 0, see 45.2.3.91.14) setting bit 3.2348.0 has no effect. Changes in EEE advertisement enable value shall only take effect after a PMA reset (see 166.3.4.1). Bit 3.2348.0 has no specified default value."

Cl 105 SC 105.1.3 P48 L39 # [REDACTED]  
 Dawe, Piers J G NVIDIA  
 Comment Type E Comment Status A PAR synch  
 This could be better aligned to the project title in the PAR, which says "for application in the automotive environment". See similar comments to other "introduction to" clauses.  
 SuggestedRemedy  
 Change "for use in automotive applications" to "for application in the automotive environment" or possibly "for use in the automotive environment" or just "in the automotive environment".

Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 Change to "glass optical fiber in the automotive environment"

Cl 105 SC 105.1.3 P48 L40 # [REDACTED]  
 Wienckowski, Natalie General Motors Company  
 Comment Type T Comment Status A PAR synch  
 P802.3cz split off P802.3dh. In doing this, the P802.3cz objectives were modified to specify glass optical fiber as plastic optical fiber is covered by dh.  
 SuggestedRemedy  
 Change: optical fiber for use in automotive applications.  
 To: glass optical fiber for use in automotive applications.

Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 Change to "glass optical fiber in the automotive environment"

Cl 105 SC 105.1.3 P50 L12 # [REDACTED]  
 Wienckowski, Natalie General Motors Company  
 Comment Type T Comment Status A PAR synch  
 P802.3cz split off P802.3dh. In doing this, the P802.3cz objectives were modified to specify glass optical fiber as plastic optical fiber is covered by dh.  
 SuggestedRemedy  
 Change: optical fiber for use in automotive applications  
 To: glass optical fiber for use in automotive applications

Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 Change to "glass optical fiber in the automotive environment"

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Cl 125 SC 125.1.3 P54 L26 # I-126  
 Dawe, Piers J G NVIDIA  
 Comment Type E Comment Status A PAR synch  
 This could be better aligned to the project title in the PAR, which says "for application in the automotive environment". See similar comments to other "introduction to" clauses.  
 SuggestedRemedy  
 Change "for use in automotive applications" to "for application in the automotive environment" or possibly "for use in the automotive environment" or just "in the automotive environment".  
 Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 Change to "glass optical fiber in the automotive environment"

Cl 125 SC 125.1.3 P54 L26 # I-49  
 Wienckowski, Natalie General Motors Company  
 Comment Type T Comment Status A PAR synch  
 P802.3cz split off P802.3dh. In doing this, the P802.3cz objectives were modified to specify glass optical fiber as plastic optical fiber is covered by dh.  
 SuggestedRemedy  
 Change: optical fiber for use in automotive applications.  
 To: glass optical fiber for use in automotive applications.  
 Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 Change to "glass optical fiber in the automotive environment"

Cl 125 SC 125.1.3 P54 L32 # I-50  
 Wienckowski, Natalie General Motors Company  
 Comment Type T Comment Status A PAR synch  
 P802.3cz split off P802.3dh. In doing this, the P802.3cz objectives were modified to specify glass optical fiber as plastic optical fiber is covered by dh.  
 SuggestedRemedy  
 Change: optical fiber for use in automotive applications.  
 To: glass optical fiber for use in automotive applications.  
 Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 Change to "glass optical fiber in the automotive environment"

Cl 125 SC 125.1.4 P56 L14 # I-51  
 Wienckowski, Natalie General Motors Company  
 Comment Type T Comment Status A PAR synch  
 P802.3cz split off P802.3dh. In doing this, the P802.3cz objectives were modified to specify glass optical fiber as plastic optical fiber is covered by dh.  
 SuggestedRemedy  
 Change: optical fiber for use in automotive applications  
 To: glass optical fiber for use in automotive applications  
 Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 Change to "glass optical fiber in the automotive environment"

Cl 125 SC 125.1.4 P56 L18 # I-52  
 Wienckowski, Natalie General Motors Company  
 Comment Type T Comment Status A PAR synch  
 P802.3cz split off P802.3dh. In doing this, the P802.3cz objectives were modified to specify glass optical fiber as plastic optical fiber is covered by dh.  
 SuggestedRemedy  
 Change: optical fiber for use in automotive applications  
 To: glass optical fiber for use in automotive applications  
 Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 Change to "glass optical fiber in the automotive environment"

Cl 125 SC 125.3 P57 L40 # I-127  
 Dawe, Piers J G NVIDIA  
 Comment Type E Comment Status A Simplification of lists  
 As bit time and pause\_quantum are based on MAC bits, the table footnotes can be simplified.  
 SuggestedRemedy  
 Change "2.5GBASE-T, 2.5GBASE-X, 2.5GBASE-T1, and 2.5GBASE-AU" to "2.5 Gigabit Ethernet" twice; change "5GBASE-T, 5GBASE-R, 5GBASE-T1, and 5GBASE-AU" to "5 Gigabit Ethernet" twice.  
 Response Response Status C  
 ACCEPT.



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Cl 131 SC 131.1.3 P59 L7 # I-128

Dawe, Piers J G

NVIDIA

Comment Type E Comment Status A PAR synch

This could be better aligned to the project title in the PAR, which says "for application in the automotive environment". See similar comments to other "introduction to" clauses.

SuggestedRemedy

Change "for use in automotive applications" to "for application in the automotive environment" or possibly "for use in the automotive environment" or just "in the automotive environment".

Response Response Status C

ACCEPT IN PRINCIPLE.

Change to "glass optical fiber in the automotive environment"

Cl 131 SC 131.1.3 P59 L7 # I-53

Wienckowski, Natalie

General Motors Company

Comment Type T Comment Status A PAR synch

P802.3cz split off P802.3dh. In doing this, the P802.3cz objectives were modified to specify glass optical fiber as plastic optical fiber is covered by dh.

SuggestedRemedy

Change: optical fiber for use in automotive applications.  
To: glass optical fiber for use in automotive applications.

Response Response Status C

ACCEPT IN PRINCIPLE.

Change to "glass optical fiber in the automotive environment"

Cl 131 SC 131.1.3 P59 L21 # I-129

Dawe, Piers J G

NVIDIA

Comment Type E Comment Status A PAR synch

"Insert a row for 50GBASE-AU after 50GBASE-KR" but 50GBASE-CR is for 3 m, 50GBASE-SR for 100 m. These AU PHYs are for 40 m.

SuggestedRemedy

Change "for use in automotive applications" to "for application in the automotive environment", "for use in the automotive environment" or "in the automotive environment".

Response Response Status C

ACCEPT IN PRINCIPLE.

The comment seems to address a different issue in line 11 (Copy and paste problem from #-130?).

The Editor assumes from the suggested remedy that the real comment is: "This could be better aligned to the project title in the PAR, which says "for application in the automotive environment". See similar comments.

Change to "glass optical fiber in the automotive environment".

Cl 131 SC 131.1.3 P59 L21 # I-54

Wienckowski, Natalie

General Motors Company

Comment Type T Comment Status A PAR synch

P802.3cz split off P802.3dh. In doing this, the P802.3cz objectives were modified to specify glass optical fiber as plastic optical fiber is covered by dh.

SuggestedRemedy

Change: optical fiber for use in automotive applications  
To: glass optical fiber for use in automotive applications

Response Response Status C

ACCEPT IN PRINCIPLE.

Change to "glass optical fiber in the automotive environment"



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Cl 166 SC 166.1.2 P62 L36 # I-138  
 Dawe, Piers J G NVIDIA  
 Comment Type E Comment Status A EZ -Pull to discuss  
 this Clause  
 SuggestedRemedy  
 this clause  
 Response Response Status C  
 ACCEPT.

Cl 166 SC 166.1.3 P62 L43 # I-139  
 Dawe, Piers J G NVIDIA  
 Comment Type T Comment Status A Full duplex  
 "Clause 4 Media Access Control (MAC) layer": call it IEEE 802.3 MAC sublayer? As these PHYs are full duplex, is the Annex 4A simplified full duplex MAC also suitable?  
 SuggestedRemedy  
 Suggest change "connect one Clause 4 Media Access Control (MAC) layer to the medium." to "connect one IEEE 802.3 Media Access Control (MAC) layer (see Clause 4 and Annex 4A) to the medium."  
 Response Response Status C  
 ACCEPT.

Cl 166 SC 166.1.4 P63 L37 # I-57  
 Wienckowski, Natalie General Motors Company  
 Comment Type E Comment Status A EZ -Pull to discuss  
 wording  
 SuggestedRemedy  
 Changed "composed by" to "composed of"  
 Also on P64L38, P66L46, P66L51.  
 Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 Page 63 Line 37  
 Page 64 Line 38  
 Page 66 Line 46  
 Page 66 Line 51  
 Change "by" to "of"

Cl 166 SC 166.1.4 P64 L11 # I-142  
 Dawe, Piers J G NVIDIA  
 Comment Type T Comment Status A Scrambler naming  
 I would not call any scrambler "additive" because they rely on XOR gates which are multipliers. I think the point is that these are synchronous or side-stream scramblers, not self synchronous scramblers.

SuggestedRemedy  
 Change to the term which is typically used in the base document.

Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 "Additive scrambler" is also used in other parts of the base document. For example C/149. However, adjective additive does not add information to the specification so it may be removed.  
 Page 64 line 11  
 Remove "with an additive scrambler"  
 Page 64 line 14  
 Page 66 line 22  
 Page 75 line 36  
 Page 84 line 49  
 Page 88 line 31  
 Page 106 line 34  
 Page 107 line 22  
 Page 147 line 20,  
 Remove "additive"

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Cl 166 SC 166.1.4 P64 L18 # 1-58

Wienckowski, Natalie General Motors Company  
 Comment Type TR Comment Status A State diagram

wording - It doesn't make sense to say "PHD information reliability is checked by CRC calculation and, if it is correct, then it is fed to state diagrams." How do you feed a state diagram?

SuggestedRemedy

Change: PHD information reliability is checked by CRC calculation and, if it is correct, then it is fed to state diagrams.  
 To: PHD information reliability is checked by CRC calculation, hdr\_crc16\_status, see 166.3.4.1, Figure 166-25, Figure 166-26, and Figure 166-27.

Response Response Status C

ACCEPT IN PRINCIPLE.  
 Change: "PHD information reliability is checked by CRC calculation and, if it is correct, then it is fed to state diagrams."  
 To: "PHD information reliability is checked by CRC calculation and, if it is correct, it is used by the PCS sublayer."

Cl 166 SC 166.2 P66 L # 1-177

Mcclellan, Brett Marvell Semiconductor, Inc.  
 Comment Type TR Comment Status R Interfaces definition

There is no definition for PMA interfaces to the PCS.  
 Without a definition of these interfaces, this specification is technically incomplete.

SuggestedRemedy

Insert a new subclause 166.2.1 Technology Dependent Interface with definitions for PMA interfaces.

Response Response Status U

REJECT.

This PHY specification makes use of service interfaces where needed for technical completeness and interoperability.

Inclusion of a PMA interface is not necessary for an implementer to build a compliant and interoperable PHY implementation.

Note that 802.3cz does not specify Autonegotiation, and therefore primitives specified in other clauses to support this feature (i.e, Clause 97 and 98) are not needed.

Cl 166 SC 166.2 P66 L1 # 1-175

Mcclellan, Brett Marvell Semiconductor, Inc.  
 Comment Type TR Comment Status A Interfaces definition

This PHY specification lacks a definition of service primitives and interfaces between sublayers.  
 Without a definition of these interfaces, this specification is technically incomplete.

SuggestedRemedy

Insert a new subclause 166.2 2.5GBASE-AU, 5GBASE-AU, 10GBASE-AU, 25GBASE-AU, and 50GBASE-AU service primitives and interfaces.

Response Response Status U

ACCEPT IN PRINCIPLE.

This PHY specification makes use of service interfaces where needed for technical completeness and interoperability.

However, the three first paragraphs of the subclause 166.2.1 can be changed to mirror other BASE-R clauses.

Page 66 lines 5 to 7,

Change "The 2.5GBASE-AU, 5GBASE-AU, or 10GBASE-AU PCS couples a 10 Gigabit Media Independent Interface (XGMII), see Clause 46, to the 2.5GBASE-AU, 5GBASE-AU, or 10GBASE-AU Physical Medium Attachment (PMA) sublayer."

to  
 "The PCS service interface of 2.5GBASE-AU, 5GBASE-AU, or 10GBASE-AU is the 10 Gigabit Media Independent Interface (XGMII), which is defined in Clause 46. The 2.5GBASE-AU, 5GBASE-AU, or 10GBASE-AU PCS provides all services required by the XGMII and couple it to the 2.5GBASE-AU, 5GBASE-AU, or 10GBASE-AU Physical Medium Attachment (PMA) sublayer."

Page 66 lines 9 to 10,

Change "The 25GBASE-AU PCS couples a Media Independent Interface for 25 Gb/s operation (25GMII), see Clause 106, to the 25GBASE-AU PMA sublayer."

to  
 "The 25GBASE-AU PCS service interface is the Media Independent Interface for 25 Gb/s operation (25GMII), which is defined in Clause 106. The 25GBASE-AU PCS provides all services required by the 25GMII and couple it to the 25GBASE-AU PMA sublayer."

Page 66 lines 12 to 13,

Change "The 50GBASE-AU PCS couples a Media Independent Interface for 50 Gb/s operation (50GMII), see Clause 132, to the 50GBASE-AU PMA sublayer."

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to: "The 50GBASE-AU PCS service interface is the Media Independent Interface for 50 Gb/s operation (50GMII), which is defined in Clause 132. The 50GBASE-AU PCS provides all services required by the 50GMII and couple it to the 50GBASE-AU PMA sublayer."

Cl 166 SC 166.2 P66 L1 # I-176

Mcclellan, Brett Marvell Semiconductor, Inc.

Comment Type TR Comment Status R Interfaces definition

There is no definition for Technology Dependent Interfaces link\_control and link\_status which are used throughout Clause 166 without indicating where link\_control comes from, or where link\_status goes to.

Without a definition of these interfaces, this specification is technically incomplete.

SuggestedRemedy

Insert a new subclause 166.2.1 Technology Dependent Interface with definitions for link\_control and link\_status

Response Response Status U

REJECT.

This PHY specification makes use of service interfaces where needed for technical completeness and interoperability.

Autonegotiation, and therefore primitives specified in other clauses to support this feature (i.e, Clause 97 and 98) are not needed.

link\_control and link\_status are mapped in subclause 166.13 (Table 166-22) to MDIO register bits.

Cl 166 SC 166.2.1 P67 L19 # I-44

Wienckowski, Natalie General Motors Company

Comment Type TR Comment Status A Reset max time

There is no definition of the PCS reset function. Without this, it can't be guaranteed that Objective #4: "Define optional startup procedure which enables the time from power\_on=FALSE to a state capable of transmitting and receiving valid data to be less than 100ms" can be met.

SuggestedRemedy

Insert new subclause before 166.2.2 called PCS Reset Function  
PCS Reset initializes all PCS functions. The PCS Reset function shall be executed whenever one of the following conditions occur:

- a)Power on (see 165.2.2.8.2).
  - b)The receipt of a request for reset from the management entity.
- PCS Reset sets pcs\_reset = TRUE while any of the above reset conditions hold true. All state diagrams take the open-ended pcs\_reset branch upon execution of PCS Reset. The reference diagrams do not explicitly show the PCS Reset function.  
The control and management interface shall be restored to operation within 10 ms from the setting of bit 3.0.15.

Add appropriate PICS (See Clause 149 PCT1 and PCT2

Response Response Status C

ACCEPT IN PRINCIPLE.

Add the shall statement (as proposed in #I-45) in page 98 line 51 (166.3.4.4 Link monitor state diagram):

"For a communication system composed of two connected link partners as shown in Figure 166-2, the time measured from the last deassertion of pma\_reset (pma\_reset equal to OFF) or pcs\_reset (pcs\_reset equal to FALSE) on either link partner, to the assertion of the link\_status variable to OK on either link partner, shall be less than 25 ms."

Add PICS accordingly.

Page 82 line 37 already defines pcs\_reset variable used in the state diagrams, and it covers conditions a) and b).

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Cl 166 SC 166.2.2.4 P71 L41 # [-148]

Dawe, Piers J G

NVIDIA

Comment Type E Comment Status A FEC description improvement

All inputs to an equation need to be defined; this is usually done with "where" and a list of definitions. There is text for alpha, the use of j defines itself, but there's nothing for x.

SuggestedRemedy

Say what x, the dummy variable, is.

Response Response Status C

ACCEPT IN PRINCIPLE.

Page 71 line 44,

Change "In Equation (166–1), , is a primitive element of the finite field defined by the primitive polynomial

$0x409 = x^{10} + x^3 + 1.$ "

to

"In this specification of the RS-FEC encoder, (*x*) is used in general as the indeterminate variable of any polynomial in mathematical expressions. Polynomial operations will be used to specify the parity calculation carried out by the RS-FEC encoder. In Equation (166–1), ( $\alpha$ ) is a primitive element of the finite Galois field  $GF(2^m)$ , therefore ( $\alpha$ ) is the root of a primitive polynomial of degree  $m$  in  $GF(2)$ . The primitive polynomial is ( *$x^{10} + x^3 + 1.$* )"

(<sup>^</sup>) will indicate superscript in the draft.

(*)* means italic font.

Cl 166 SC 166.2.2.4 P71 L44 # [-149]

Dawe, Piers J G

NVIDIA

Comment Type T Comment Status A FEC description improvement

"alpha is a primitive element of the finite field" - means?

SuggestedRemedy

Please explain. And see next comment

Response Response Status C

ACCEPT IN PRINCIPLE.

Page 71 line 44,

Change "In Equation (166–1), , is a primitive element of the finite field defined by the primitive polynomial

$0x409 = x^{10} + x^3 + 1.$ "

to

"In this specification of the RS-FEC encoder, (*x*) is used in general as the indeterminate variable of any polynomial in mathematical expressions. Polynomial operations will be used to specify the parity calculation carried out by the RS-FEC encoder. In Equation (166–1), ( $\alpha$ ) is a primitive element of the finite Galois field  $GF(2^m)$ , therefore ( $\alpha$ ) is the root of a primitive polynomial of degree  $m$  in  $GF(2)$ . The primitive polynomial is ( *$x^{10} + x^3 + 1.$* )"

(<sup>^</sup>) will indicate superscript in the draft.

(*)* means italic font.

Cl 166 SC 166.2.2.4 P71 L45 # [-150]

Dawe, Piers J G

NVIDIA

Comment Type T Comment Status A FEC description improvement

Please advertise the information provided.

SuggestedRemedy

Cross-reference Table 166-3 from here, or move the table and its introductory sentence to here.

Response Response Status C

ACCEPT IN PRINCIPLE.

Move Table 166-3 and its introductory sentence to page 71 line 45.

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Cl 166 SC 166.2.2.4 P72 L31 # I-151  
 Dawe, Piers J G NVIDIA  
 Comment Type T Comment Status R FEC description improvement  
 GF add, GF multiply  
 SuggestedRemedy  
 Please define or give a reference  
 Response Response Status C  
 REJECT.  
 GF Multiply and GF Add are already used in all 802.3-2022 clauses defining Reed-Solomon codes.  
 See Figures 76-11, 91-5, 97-8, 113-13, 119-9, and 149-9.

Cl 166 SC 166.2.2.4 P72 L54 # I-152  
 Dawe, Piers J G NVIDIA  
 Comment Type E Comment Status R Draft layout  
 Two-column table inconveniently split, last line of first part not thin as would be needed.  
 SuggestedRemedy  
 Set the table so that it isn't split over two pages  
 Response Response Status C  
 REJECT.  
 Refer this change to IEEE SA Editorial staff for consideration during preparation for publication.

Cl 166 SC 166.2.2.4 P73 L17 # I-62  
 Wienckowski, Natalie General Motors Company  
 Comment Type E Comment Status A EZ -Pull to discuss  
 redundant wording, codeword and CW are the same  
 SuggestedRemedy  
 Change: codeword CW  
 To: codeword  
 Alternatively, if you are defining the definition CW, you could put: codeword (CW)  
 Also P160L14, P160L25, P160L27  
 Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 On page 73 line 17  
 Change "codeword CW"  
 to  
 "codeword (CW)".  
 Page 160 line 14,  
 Page 160 line 25,  
 Page 160 line 27,  
 Change "codeword CW" to "codeword".

Cl 166 SC 166.2.2.5 P73 L19 # I-154  
 Dawe, Piers J G NVIDIA  
 Comment Type T Comment Status A Scrambler naming  
 binary scrambler - means? The 7000-page base document contains many scramblers, I assume they are all "binary" but only Clause 115 uses that term.  
 SuggestedRemedy  
 For consistency across 802.3, change "binary scrambler" to "scrambler" and "binary descrambler" to "descrambler" throughout.  
 Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 Change "binary scrambler" to "scrambler" and "binary descrambler" to "descrambler" throughout P802.3cz.

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Cl 166 SC 166.2.2.5 P73 L21 # I-153

Dawe, Piers J G

NVIDIA

Comment Type E Comment Status A Number writing

This is unreadable. As the 802.3 editorial guidelines say "In text, where this improves clarity, follow the IEEE Editorial Style Manual: Use spaces instead of commas between numbers in tens or hundreds of thousands (e.g., 62 000, 100 000, but 4000).", but doing so trashes clarity here...

SuggestedRemedy

Change 195 840 to 195840, here, at line 38, and elsewhere in running text to improve readability.

Response Response Status C

ACCEPT IN PRINCIPLE.

Change "195 840" to "195840" through all document.

Cl 166 SC 166.2.2.7 P77 L1 # I-156

Dawe, Piers J G

NVIDIA

Comment Type T Comment Status A PCS subclause layout

There are several definitions of 64B/65B encoding in the base standard; I doubt we need another one.

SuggestedRemedy

Choose the most suitable one and refer to it, removing most of this material except the PHY-specific // and /L/ insertion and deletion rules.

Response Response Status C

ACCEPT IN PRINCIPLE.

This point has already been discussed in the WG ballot process. The resulting text is clearer than using reference to external clauses. Other 802.3-2022 clauses take the same approach to get all relevant specifications in the same clause. However, the relationship with other clauses can be highlighted using NOTES in the Figures.

Add NOTE in Figure 166-14:

"NOTE -- Figure 166-14 is the same as Figure 55-9, Figure 113-9, Figure 126-8, and Figure 149-8 in IEEE Std 802.3-2022."

Add NOTE in Figure 166-15:

"NOTE -- Figure 166-15 is the same as Figure 113-10 in IEEE Std 802.3-2022."

Cl 166 SC 166.2.2.7.3 P80 L4 # I-157

Dawe, Piers J G

NVIDIA

Comment Type E Comment Status A Table combination

The two 65-bit block format tables can be combined for easier reading and understanding.

SuggestedRemedy

Make a single table with table footnotes identifying the five(?) rows that apply to 50G or all but 50G.

Response Response Status C

ACCEPT IN PRINCIPLE.

During comment resolution the commenter realized that page and line was wrong (right one: Page 78 Line 11).

This point has already been discussed in the draft development and WG balloting.

Separate tables for 50GBASE-U reinforce the differences by allowing a separate definition for 50GBASE-U in the text (Page 77 line 51 and 54) and avoid the use of definition statements in the footnotes.

However, the following changes were agreed:

Page 77 Line 54 (after last sentence):

Add "Figure 166-14 and Figure 166-15 are the same except that block type field 0x4B is encoded differently and block type field values 0x55, 0x66, 0x33, and 0x2D are only in Figure 166-14" with editorial license.

Page 79 Line 43 (after last sentence):

Add "Table 166-4 and Table 166-5 are the same except that reserved control characters are only in Table 166-4" with editorial license.



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Cl 166 SC 166.2.2.7.4 P80 L4 # [REDACTED]

Dawe, Piers J G NVIDIA  
 Comment Type E Comment Status A Table combination

The two control code tables should be combined for easier reading and understanding.

*SuggestedRemedy*

Make a single 5-column table with columns for 2.5, 5, 10, 25G PCS and for 50G PCS.

Response Response Status C

ACCEPT IN PRINCIPLE.

This point has already been discussed in the draft development and WG balloting.

Separate tables for 50GBASE-U reinforce the differences by allowing a separate definition for 50GBASE-U in the text (Page 79 line 36 and 37) and avoid the use of definition statements in the footnotes.

However, the following changes were agreed:

Page 77 Line 54 (after last sentence):

Add "Figure 166-14 and Figure 166-15 are the same except that block type field 0x4B is encoded differently and block type field values 0x55, 0x66, 0x33, and 0x2D are only in Figure 166-14" with editorial license.

Page 79 Line 43 (after last sentence):

Add "Table 166-4 and Table 166-5 are the same except that reserved control characters are only in Table 166-4" with editorial license.

Cl 166 SC 166.2.2.8.2 P82 L40 # [REDACTED]

Dawe, Piers J G NVIDIA  
 Comment Type T Comment Status A Low power

"low-power mode" is mentioned here and nowhere else, so not defined. What mode is this? Is this the wrong name? Is "a low power state" in 166.6.1.3.3 related?

*SuggestedRemedy*

Please clarify

Response Response Status C

ACCEPT IN PRINCIPLE.

Change "low-power mode" to

"Low Power = 1 (see Table 166-22)."

Cl 166 SC 166.2.2.8.3 P83 L20 # [REDACTED]

Wienckowski, Natalie General Motors Company  
 Comment Type E Comment Status A Standard Style Manual

The first letter of the items a)-c) under "C" should be capitalized.

*SuggestedRemedy*

Capitalize "Eight", "One", and "Two".

Response Response Status C

ACCEPT IN PRINCIPLE.

After ":" or ";", capitalization is not needed.

See examples in 802.3-2022, page 4603, subclause 113.3.6.2.4.

However, page 83 lines 35 and 36 and other occurrences are not consistent and should be lower case:

Page 83 line 35

Change "Eight" to "eight"

Page 83 line 36

Change "One" to "one"

Page 90 line 37, 38 and 39

Change "A" to "a"

Page 91 line 5, 7 and 9

Change "A" to "a"

Cl 166 SC 166.2.3.3 P86 L13 # [REDACTED]

Wienckowski, Natalie General Motors Company  
 Comment Type E Comment Status A PCS receiver ordering

awkward wording

*SuggestedRemedy*

Change: The PCS receiver ordering shall separate

To: The PCS receiver shall separate

Response Response Status C

ACCEPT IN PRINCIPLE.

Change: "The PCS receiver ordering shall separate from each RS-FEC message the group of 80 65-bit blocks and 20-bit encoded PHD sub-block as specified in Figure 166-18."

To: "The PCS receiver shall separate each RS-FEC message into the group of 80 65-bit blocks and the 20-bit encoded PHD sub-block as specified in Figure 166-18."

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Cl 166 SC 166.2.3.4 P86 L20 # I-70

Wienckowski, Natalie General Motors Company  
 Comment Type TR Comment Status A State diagram

Data is not available to a state diagram, in this case it is available to the PMA.

SuggestedRemedy

Change: the contents of the different PHD fields be available to the PMA state diagrams  
 To: the contents of the different PHD fields be available to the PMA

Response Response Status C

ACCEPT IN PRINCIPLE.  
 Change: "the contents of the different PHD fields be available to the PMA state diagrams and to the other PCS receive functions that use this information"  
 To: "the contents of the different PHD fields be available to the PMA and PCS receive sublayers"

Cl 166 SC 166.2.3.7.1 P86 L49 # I-178

Mcclellan, Brett Marvell Semiconductor, Inc.  
 Comment Type T Comment Status A Local faults reference

Local Faults for 50GMII are different than for XGMII/25GMII. There should be a reference to where Local Faults are defined for each interface.

SuggestedRemedy

On line 49 insert "The Local Fault ordered set for XGMII and 25GMII is defined in 46.3.4."  
 On line 51 insert "The Local Fault ordered set for 50GMII is defined in 81.3.4."

Response Response Status C

ACCEPT.

Cl 166 SC 166.3 Dawe, Piers J G P91 L47 # I-160

NVIDIA  
 Comment Type E Comment Status R Standard Style Manual

As traditionally a sublayer gets a clause to itself

SuggestedRemedy

Start 166.3 on a new page, asfter the PCS state diagrams. Similarly for 166.6, PMD.

Response Response Status C

REJECT.  
 IEEE 802.3-2022 does not follow the commenter proposed editorial rule, and is not covered in 2021 IEEE SA Standards Style Manual (<https://mentor.ieee.org/myproject/Public/mytools/draft/styleman.pdf>).

Cl 166 SC 166.3.1 P94 L1 # I-45

Wienckowski, Natalie General Motors Company  
 Comment Type TR Comment Status A Reset max time

There is no definition of the PMA reset function. Without this, it can't be guaranteed that Objective #4: "Define optional startup procedure which enables the time from power\_on=FALSE to a state capable of transmitting and receiving valid data to be less than 100ms" can be met.

SuggestedRemedy

Insert new subclause before 166.3.1 called PMA Reset Function  
 The PMA Reset function shall be executed whenever one of the two following conditions occur:  
 a)Power for the device containing the PMA has not reached the operating state.  
 b)The receipt of a request for reset from the management entity.  
 PMA Reset sets pma\_reset = ON while any of the above reset conditions hold TRUE. All state diagrams take the open-ended pma\_reset branch upon execution of PMA Reset. The reference diagrams do not explicitly show the PMA Reset function.  
 TheBASE-AU PMA takes no longer than 100 ms to enter the PCS\_DATA state after exiting from reset or low power mode (see Figure 166-23).  
 Add appropriate PICS (See Clause 149 PR1)

Response Response Status C

ACCEPT IN PRINCIPLE.

Add the following shall statement in page 98 line 51 (166.3.4.4 Link monitor state diagram)

"For a communication system composed of two connected link partners as shown in Figure 166-2, the time measured from the last deassertion of pma\_reset (pma\_reset equal to OFF) or pcs\_reset (pcs\_reset equal to FALSE) on either link partner, to the assertion of the link\_status variable to OK on either link partner, shall be less than 25 ms."

Add PICS accordingly.

Page 95 line 42 already defines pma\_reset variable used in the state diagrams, and it covers conditions a) and b).

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Cl 166 SC 166.3.4.2 P96 L37 # I-72  
 Wienckowski, Natalie General Motors Company  
 Comment Type E Comment Status A EZ-Pull to discuss  
 missing Oxford comma  
 SuggestedRemedy  
 Change: clock recovery and train its equalizers  
 To: clock recovery, and train its equalizers  
 Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 Change  
 "The remote PHY can perform Transmit Block synchronization, clock recovery and train its equalizers (tx\_enable <= TRUE)"  
 to  
 "The remote PHY can perform Transmit Block synchronization, clock recovery and equalizer training (tx\_enable <= TRUE)"

Cl 166 SC 166.3.4.6.4 P103 L19 # I-73  
 Wienckowski, Natalie General Motors Company  
 Comment Type TR Comment Status A State diagram  
 A state diagram cannot "wait" for something. It can remain in a state until something happens.  
 SuggestedRemedy  
 Change: The state diagram waits for the first estimate of the link margin to be available.  
 To: The state diagram remains in the PMAMON\_DISABLE state until the first estimate of the link margin is available.  
 Response Response Status C  
 ACCEPT.

Cl 166 SC 166.5.2 P109 L21 # I-78  
 Wienckowski, Natalie General Motors Company  
 Comment Type E Comment Status A Primitive parameters  
 How do you generate a pattern toward a primitive? This doesn't make sense.  
 SuggestedRemedy  
 Change: The PMA generates this pattern towards the primitive  
 To: The PMA generates this pattern for the primitive  
 Also P109L28  
 Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 Page 109 line 21,  
 Page 109 line 28,  
 Change "The PMA generates this pattern towards the primitive PMD\_COMSIGNAL.request (see 166.6.1.1)."  
 to  
 "The PMA generates this pattern for the service interface below the PMA via the PMD\_COMSIGNAL.request primitive (see 166.6.1.1)."

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CI 166 SC 166.5.4 P109 L38 # I-79  
 Wienckowski, Natalie General Motors Company  
 Comment Type TR Comment Status A EZ-Pull to discuss

The current text makes no sense. I'm not sure if my interpretation is correct, but this was the only thing I could think that it meant.

SuggestedRemedy

Change: The initial values of the bit sequence A are an 8-bit sequence of 0s, 1, an 11-bit sequence of 0s, 1,  
 To: The initial values of the bit sequence A are an 8-bit sequence of 0s, a single bit of 1, an 11-bit sequence of 0s, a single bit of 1,  
 The same issue can be found in 166.5.5, the initial values of A1 and A2.  
 The other option is to write out all the bits as is done for A3.

Response Response Status U

ACCEPT IN PRINCIPLE.  
 Page 109 line 38,

Change "The initial values of the bit sequence A are an 8-bit sequence of 0s, 1, an 11-bit sequence of 0s, 1,"  
 to  
 "The first 33 bits of the bit sequence A are an 8-bit sequence of 0s, a single bit of 1, an 11-bit sequence of 0s, a single bit of 1,"

Page 109 line 44

Change "The initial values"  
 to  
 "The first 78 bits"

Page 109 line 52

Change "The initial values"  
 to  
 "The first 28 bits"

Page 110 line 39

Change "The initial values of the bit sequence A1 are a 29-bit sequence of 0s, 1, a 27-bit sequence of 0s, 1, 0, 0, 1, and a 24-bit sequence of 0s."  
 to "The first 85 bits of the bit sequence A1 are a 29-bit sequence of 0s, a single bit of 1, a 27-bit sequence of 0s, a single bit of 1, a single bit of 0, a single bit of 0, a single bit of 1, and a 24-bit sequence of 0s."

Page 110 line 46,  
 Change "The initial values of the bit sequence A2 are 0, 1, 1, 0, 1, a 9-bit sequence of 0s, 1, 0, 0, and a 10-bit

sequence of 1s."  
 to  
 "The first 27 bits of the bit sequence A2 are a single bit of 0, a 2-bit sequence of 1s, a single bit of 0, a single bit of 1, a 9-bit sequence of 0s, a single bit of 1, a 2-bit sequence of 0s, and a 10-bit sequence of 1s."

CI 166 SC 166.5.4 P109 L52 # I-80  
 Wienckowski, Natalie General Motors Company  
 Comment Type E Comment Status A Number writing

Don't use "0b" before binary bit values.

SuggestedRemedy

Change: 0b1010101001010101010110101010101010101011011010  
 To: 10101010010101010101101010101010101011011010

Response Response Status C

ACCEPT.

CI 166 SC 166.6.1 P112 L17 # I-82  
 Wienckowski, Natalie General Motors Company  
 Comment Type TR Comment Status A Primitive parameters

How do you exchange signal amplitude?

SuggestedRemedy

Change: supports the exchange of signal amplitude  
 To: supports the exchange of signals of different amplitudes  
 Also P113L7

Response Response Status C

ACCEPT IN PRINCIPLE.  
 Page 112 line 17,  
 Change "supports the exchange of signal amplitude"  
 to "supports the exchange of communication signals"

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Cl 166 SC 166.6.2.1 P113 L48 # I-85  
 Wienckowski, Natalie General Motors Company  
 Comment Type E Comment Status A EZ-Pull to discuss  
 missing article  
 SuggestedRemedy  
 Change: For purpose  
 For the purpose  
 Response Response Status C  
 ACCEPT IN PRINCIPLE.  
 Change "For purpose"  
 to  
 "For purposes"

Cl 166 SC 166.6.2.2 P114 L21 # I-86  
 Wienckowski, Natalie General Motors Company  
 Comment Type TR Comment Status A Primitive parameters  
 What is an amplitude parameter? This doesn't make sense.  
 SuggestedRemedy  
 Change: The PMD transmit function shall convert the amplitude parameter tx\_signal  
 requested  
 To: The PMD transmit function shall convert the amplitude of the tx\_signal parameter  
 requested  
 Also on P114L39, PMD1, and PMD3.  
 Response Response Status C  
 ACCEPT IN PRINCIPLE.  
  
 Page 114 line 21,  
 Change: "The PMD transmit function shall convert the amplitude parameter tx\_signal  
 requested by the PMD service interface primitive PMD\_COMSIGNAL.request"  
 To: "The PMD transmit function shall convert the communication signal amplitude given by  
 the tx\_signal parameter requested by the PMD service interface primitive  
 PMD\_COMSIGNAL.request"  
  
 Page 114 line 39,  
 Change "The PMD receive function shall convert the optical signal received at the MDI into  
 the amplitude parameter rx\_signal of the PMD service interface primitive  
 PMD\_COMSIGNAL.indication"  
 To: "The PMD receive function shall convert the optical signal received at the MDI into the  
 communication signal amplitude given by the rx\_signal parameter of the PMD service  
 interface primitive PMD\_COMSIGNAL.indication"  
  
 Page 151 line 29,  
 Change "The PMD transmit function converts the amplitude parameter tx\_signal into optical  
 signal p at TP2 according to Equation (166–7)."  
 to "The PMD transmit function converts the communication signal amplitude given by the  
 tx\_signal parameter into optical signal p at TP2 according to Equation (166–7)."  
  
 Page 151 line 38  
 Change "The PMD receive function converts the optical signal received at the MDI into  
 amplitude parameter rx\_signal."  
 to "The PMD receive function converts the optical signal received at the MDI into  
 the communication signal amplitude given by the rx\_signal parameter."

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Cl 166 SC 166.6.2.2 P114 L41 # [-87]

Wienckowski, Natalie General Motors Company  
 Comment Type TR Comment Status A Primitive parameters

What is an amplitude parameter? This doesn't make sense.

SuggestedRemedy

Change: into the amplitude parameter  
 rx\_signal  
 To: into the amplitude of the rx\_signal parameter  
 Also PMD3

Response Response Status C

ACCEPT IN PRINCIPLE.

Page 114 line 39,  
 Change "The PMD receive function shall convert the optical signal received at the MDI into the amplitude parameter rx\_signal of the PMD service interface primitive PMD\_COMSIGNAL.indication"  
 To: "The PMD receive function shall convert the optical signal received at the MDI into the communication signal amplitude given by the rx\_signal parameter of the PMD service interface primitive PMD\_COMSIGNAL.indication"

Page 151 line 38  
 Change "The PMD receive function converts the optical signal received at the MDI into amplitude parameter rx\_signal."  
 to "The PMD receive function converts the optical signal received at the MDI into the communication signal amplitude given by the rx\_signal parameter."

Cl 166 SC 166.6.3.2 P116 L40 # [-107]

Murty, Ramana Broadcom Inc.  
 Comment Type TR Comment Status R Wavelength

Center wavelength (range) is defined over the narrow range of 970 - 990 nm. The justification for not accepting other source wavelengths, such as the one given in perezaranda\_3cz\_01b\_080621\_vcsel\_reliability.pdf, are erroneous. The wavelength range should be expanded to allow a wide range of suppliers to participate.

SuggestedRemedy

Expand the center wavelength range to 840 - 990 nm.

Response Response Status U

REJECT.  
 There is no consensus to make a change.  
 -----

The following is background on multiple hours of discussion on comments #-107 and #-108 within the P802.3cz Task Force (acting as the comment resolution group).

[begin proposed response to #-107]

Proposal already discussed at Montreal plenary meeting (July 2022). Consensus to modify wavelength range was not reached (see [https://www.ieee802.org/3/cz/public/jul\\_2022/Minutes\\_3cz\\_01\\_0722.pdf](https://www.ieee802.org/3/cz/public/jul_2022/Minutes_3cz_01_0722.pdf) Motion #3 and comment #32 to P802.3cz/D2.1).

Range of +/- 10 nm is consistent with other projects that use different nominal center wavelength, i.e. C/138 138.7.1, Table 138-8. C/95 95.7.1, Table 95-6. C/52 52.5.1, Table 52-7.

The TX and RX characteristics have been derived with margin considering real 980nm device samples operating in a range of backside temperature between -40°C and +125°C and bias current of up to 8 mA. It was demonstrated during the project that required wear-out reliability cannot be achieved with 850nm VCSEL devices using similar current densities. It was also demonstrated that in order to marginally meet the wear-out reliability requirements, the bias current should be reduced < 5 mA in high temperature, therefore reducing the speed and optical power and increasing the RIN of the VCSEL devices, hence making much more difficult the PHY implementation. On top of that, it was also demonstrated that 980nm devices are much less dependent with temperature, so they present a much more uniform threshold current between -40 and 125°C. 850nm devices could be optimized for high temperature, but degrading (or making impossible) operation at low temperature and viceversa.

Technology for manufacturing 980nm VCSEL devices is widely available. It was developed during last decade for sensor devices. Producing reliable, high speed, low noise, and efficient VCSELs at 980nm is much easier than at 850nm. This will allow to expand the availability of manufacturers that can supply photonics for BASE-AU PHYs in automotive industry.

[end proposed response to #-107]

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Two presentations on the VCSEL reliability were made during comment resolution discussion (see [https://www.ieee802.org/3/cz/public/oct\\_2022/murty\\_3cz\\_01\\_1022.pdf](https://www.ieee802.org/3/cz/public/oct_2022/murty_3cz_01_1022.pdf) and [https://www.ieee802.org/3/cz/public/oct\\_2022/perezaranda\\_3cz\\_02\\_1022\\_vcsl\\_rel.pdf](https://www.ieee802.org/3/cz/public/oct_2022/perezaranda_3cz_02_1022_vcsl_rel.pdf)), in addition to an in-depth discussion of the impact on system technology and testing when the wavelength range is extended as proposed in #-107 and #-108.

Straw Poll (all individuals attending allowed to vote) to accept the above proposed response result: Yes 19 No 5 Abstain 8.  
Motion (only 802.3 voting members allowed to vote) to accept the above proposed response failed: Yes 13 No 6 Abstain 5.

There was no other proposal for a response to the comment. Therefore it was concluded that there is no consensus to make the change proposed by the comment.

Cl 166 SC 166.6.3.2 P117 L16 # -163

Dawe, Piers J G NVIDIA  
Comment Type TR Comment Status A 50GBASE-AU extinction ratio

The extinction ratio spec should make allowance for laser speed, the wide temperature range and the extra accuracy desired when using PAM4. This has 4 dB at all rates, 50GBASE-SR has 3 dB. With further study, 3.5 dB might be feasible.

SuggestedRemedy

For 50GBASE-AU, change 4 dB to 3 dB.

Response Response Status U

ACCEPT IN PRINCIPLE.

Reference receiver of 50GBASE-SR is different of 50GBASE-AU.

Feasibility of min 4 dB has been determined based on measurements at extreme temperatures. See examples in contribution [perezaranda\\_3cz\\_01\\_221011\\_comment\\_i\\_163.pdf](https://www.ieee802.org/3/cz/public/oct_2022/perezaranda_3cz_01_221011_comment_i_163.pdf).

Decreasing min ER impacts the receiver sensitivity in 0.2 dB when we decrease ER from 4 dB to 3 dB in 50 Gb/s operation.

Page 117 line 16  
Table 166-9  
Change "Extinction ratio (min) 4"  
to  
"Extinction ratio (min) 3.5" for 50GBASE-AU.

Cl 166 SC 166.6.3.3 P117 L40 # -108

Murty, Ramana Broadcom Inc.

Comment Type TR Comment Status R Wavelength

Center wavelength (range) is defined over the narrow range of 970 - 990 nm. "Rainbow" photodetectors that can detect a wide range of wavelengths have been widely used in datacom.

SuggestedRemedy

Expand the center wavelength range to 840 - 990 nm.

Response Response Status U

REJECT.  
There is no consensus to make a change.

The following is background on multiple hours of discussion on comments #-107 and #-108 within the P802.3cz Task Force (acting as the comment resolution group).

[begin proposed response to #-108]

Proposal already discussed at Montreal plenary meeting (July 2022). Consensus to modify wavelength range was not reached (see [https://www.ieee802.org/3/cz/public/jul\\_2022/Minutes\\_3cz\\_01\\_0722.pdf](https://www.ieee802.org/3/cz/public/jul_2022/Minutes_3cz_01_0722.pdf) Motion #3 and comment #32 to P802.3cz/D2.1).

Expanding the center wavelength range to 840 - 990nm will imply that all the components between light emission and reception, including the photodetector, have to be validated and qualified to meet all the requirements for the full range of spectrum. This includes coupling optics in TX and RX as well as inline connections and fiber. Assuming butt-coupling and physical contact connectivity, which can be wavelength agnostic, as a feasible solution for automotive application just because it is used in data-centers may be an erroneous assumption.

Expanded beam optics, physical contact, and air gap connections are under consideration by connector makers to supply a robust, low cost, and fully automated terminated optical connectivity technology to automotive industry based on OM3 fiber. In the implementation of optical coupling, lenses and EBO connections, wavelength dependent refractive index and absorption of used materials needs to be considered. If same materials have to support reflow soldering, automotive environmental and mechanical conditions and perform well in a much wider range of wavelengths, then we are imposing constraints that will limit the solutions and will finally increase the cost without necessity. Transceiver is not only affected by the materials used for optical coupling but also photodetector.

[end proposed response to #-108]

Two presentations on the VCSEL reliability were made during comment resolution discussion (see [https://www.ieee802.org/3/cz/public/oct\\_2022/murty\\_3cz\\_01\\_1022.pdf](https://www.ieee802.org/3/cz/public/oct_2022/murty_3cz_01_1022.pdf) and [https://www.ieee802.org/3/cz/public/oct\\_2022/perezaranda\\_3cz\\_02\\_1022\\_vcsl\\_rel.pdf](https://www.ieee802.org/3/cz/public/oct_2022/perezaranda_3cz_02_1022_vcsl_rel.pdf)), in

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addition to an in-depth discussion of the impact on system technology and testing when the wavelength range is extended as proposed in #-107 and #-108.

Straw Poll (all individuals attending allowed to vote) to accept the above proposed response result: Yes 19 No 5 Abstain 8.

Motion (only 802.3 voting members allowed to vote) to accept the above proposed response failed: Yes 13 No 6 Abstain 5.

There was no other proposal for a response to the comment. Therefore it was concluded that there is no consensus to make the change proposed by the comment.

Cl 166 SC 166.7 P119 L1 # [redacted]

Dawe, Piers

Comment Type E Comment Status A Late

Sections 166.7 to 166.10 should be under 166.6, PMD, not beside it.

SuggestedRemedy

Decrease hierarchy of subclauses 166.7 to 166.10 one level.

Response Response Status C

ACCEPT.

Cl 166 SC 166.7.1.1 P120 L16 # I-165

Dawe, Piers J G

NVIDIA

Comment Type E Comment Status A Table combination

Tables 166-13, 14 can be combined

SuggestedRemedy

combine the tables

Response Response Status C

ACCEPT IN PRINCIPLE.

Combine Table 166-13 and Table 166-14 by adding a different pattern column for each value of G.

Cl 166 SC 166.7.4.1 P121 L46 # [-166]

Dawe, Piers J G

NVIDIA

Comment Type T Comment Status A BT4 bandwidths

These BT4 bandwidths are 75.3% of the signalling rate. The ones in the scope hardware are already e.g. 70.1%, 73% of these signalling rates (75% of slightly different signalling rates). It's not worth creating new scope hardware for such minor differences

SuggestedRemedy

Align with the bandwidths that scopes actually have: e.g. 7.5, 19.34 GHz.

Response Response Status C

ACCEPT IN PRINCIPLE.

In the specification of the BT4 filter bandwidths, it has been considered that system impulse response correction is implemented in the sampling oscilloscope, which is usual practice in modern equipment. In case of real-time oscilloscopes, BT4 is usually implemented in digital filters, so frequency configuration is highly flexible. Therefore, the bandwidth can be adjusted to any value related with baud-rate. E.g. 16.4 GHz of TDFOM setup (166.7.8.1) is not related with any other data-rate, but specified so that input BT4 filter approximates the worst case EMB of 40 m OM3 at 980nm.

However, the noise should have taken into account, and the reuse of bandwidths already used in other Clauses can be an advantage.

Table 166-15

Change BT\_-3dB bandwidth to 7.5 GHz for 2.5, 5 and 10GBASE-AU (mirrors Clause 52 bandwidth)

Change BT\_n bandwidth to 7.8 GHz for 2.5, 5 and 10GBASE-AU (mirrors Clause 52 bandwidth)

Change BT\_-3dB bandwidth to 19.34 GHz for 25 and 50GBASE-AU (mirrors Clause 95 and 112 bandwidth for Tx Eye).

Change BT\_n bandwidth to 20.11 GHz for 25 and 50GBASE-AU (mirrors Clause 95 and 112 bandwidth for Tx Eye).

Subclause 166.5.2:

Page 109 line 20

Change nsq value for 2.5GBASE-AU from 4 to 2



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Cl 166 SC 166.7.4.1 P121 L53 # L-167

Dawe, Piers J G

NVIDIA

Comment Type T Comment Status R CRU corner

CRU corner is lower than usual, 100 kHz for 2.5 to 10G, 1 MHz for 25G and 50G, vs. 4 MHz for 10 GBd, 10 for 25 and 4 for 50

SuggestedRemedy

For 10G, change from 100 kHz to 400 kHz to keep in proportion with 25G and 50G. For 5G, consider changing 100 kHz to 200 kHz.

Response Response Status C

REJECT.

CRU corner is lower than usual.

In [https://www.ieee802.org/3/cz/public/8\\_feb\\_2022/perezaranda\\_3cz\\_03b\\_080222\\_test\\_metho ds.pdf](https://www.ieee802.org/3/cz/public/8_feb_2022/perezaranda_3cz_03b_080222_test_metho ds.pdf) was explained the rational behind the CRU low frequency corner.

This frequency corner is fundamentally affected by the LPI operation mode. After LPI is detected, while receiving Refresh codewords, the receiver only needs to sample, equalize and detect a small portion of symbols of each CW (last n 65-bit blocks plus the first m repeated 20-bit PHD sub-blocks for Wake detection and robust decoding of PHD).

Both clocks, TX and RX, should experience small deviation during Refresh CW transmission. The minimum clock recovery actuation period is equivalent to a CW (5440 bits) transmission time. For 50 Gb/s CW time is 108.8 ns. For 2.5 Gb/s CW transmission time is 2176 ns.

A CRU corner frequency of less than 1/4 the CW transmission rate is considered (Nyquist frequency of OJTF of RX CDR will be 1/2 CW transmission rate, so 1/4 is in the middle of the band of the control filter loop, so it is doable).

Under this consideration, the CRU corner frequency would be 2 MHz for 50 Gb/s, and 100 kHz for 2.5 Gb/s operation.

In general lower corner-frequencies in CRU spec will translate in an easier RX CDR implementation, and higher ones in easier TX PLL implementation. It is a trade-off, and in general we can consider that can scale with rate.

However, if we consider that multi-rate PHY components are expected in the market, then it is desirable to use the same PLL in some of them to simplify the implementation.

Multi-rate consideration for CRU specification was re-considered in two rate ranges in D2.1 comment resolution.

With this re-consideration we can make easier to meet the specifications in high rate modes, .i.e. easier TX PLL design without penalizing the RX CDR. This does not prevent

implementation of multi-rate components support from 2.5 to 50 Gb/s, because different PLL/VCO technology is expected for rates of  $\leq 10$  Gb/s and  $\geq 25$  Gb/s. Based on that, two CRU corner frequencies were considered for two data rate-ranges:

- First range: 2.5, 5, and 10Gb/s. CRU corner freq = 100 kHz
- Second range: 25 and 50 Gb/s. CRU corner freq = 1 MHz.

Cl 166 SC 166.7.8.2 P125 L7 # L-168

Dawe, Piers J G

NVIDIA

Comment Type TR Comment Status A Antialiasing filters

is composed by the concatenation of two first-order low-pass filter with -3 dB bandwidth of  $S \times 26.5625 / 2$  GHz - not clear if that's each or in combination

SuggestedRemedy

Please clarify

Response Response Status U

ACCEPT IN PRINCIPLE.

Change "For BASE-AU with  $G = 2$ , the antialiasing filter is composed by the concatenation of two first-order low-pass filter with  $-3$  dB bandwidth of  $S \times 26.5625 / 2$  GHz."

to "For BASE-AU with  $G = 2$ , the antialiasing filter is composed of the concatenation of two first-order low-pass filter with  $-3$  dB bandwidth of  $S \times 26.5625 / 2$  GHz each one."

Cl 166 SC 166.7.8.2.1 P125 L45 # L-169

Dawe, Piers J G

NVIDIA

Comment Type T Comment Status A Equalization filter definition

This way of describing filters is unlike e.g. 121.8.5.4 TDECQ reference equalizer. z is not defined or needed.

SuggestedRemedy

Rewrite following other clauses, defining all quantities and functions as necessary.

Response Response Status C

ACCEPT IN PRINCIPLE.

The description of the filters is consistent and mathematically coherent. z represents the delay and it is necessary to specify the B(z) and F(z) polynomials.

Add definition of z as follows:

Page 125, line 42,  
Add at the end of the line "z<sup>i</sup> represents a delay of i unit intervals"

Page 130, line 37,  
Add at the end of the line "z<sup>i</sup> represents a delay of i unit intervals"

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Cl 166 SC 166.7.8.2.1 P126 L11 # [REDACTED]

Dawe, Piers J G NVIDIA  
 Comment Type T Comment Status A Equalization filter definition

I would not expect that a 2.5G or 5G link would benefit much from the second and third DFE tap

*SuggestedRemedy*

Consider reducing to 1 or 2 DFE taps

Response Response Status C

ACCEPT IN PRINCIPLE.

According to equation (166-11), the first coefficient of B(z) polynomial is 1 w/o delay.

According to Figure 166-41 the transmitted patten is filtered by 1-B(z), which is equivalent to a filter with N\_B-1 taps.

Therefore, the number of feedback taps considered in the DFE is N\_B-1: 2 feedback taps for 25, 10, 5, 2.5 Gb/s and 1 feedback tap for 50 Gb/s, which is consistent with one of the options proposed by the commenter.

The current number of feedback taps for 2.5 and 5 Gb/s offers more flexibility for TX and RX implementation.

F(z) and B(z) are part of a reference RX used for TDFOM and SRS calibration. There might be implementations where no B(z) is implemented in the receiver, or higher or lower number of feedback taps are used.

In a multi-rate PHY is expected that same RX circuitry will be used for different rates, e.g. 2.5, 5, and 10 Gb/s.

However, the readability of the text may be improved by using a definition of B(z) that mirrors the one given in Clause 93.

Figure 166-41:

Change "1 - B(z)" to "B(z)".

Eq (166-11):

Change to "B(z) = sum(i=1,Nb, b[i]z^i)"

Table 166-11:

Change number of taps of the B(z) filter (N\_B): "3" to "2", and "2" to "1".

Page 126, line 14:

Change "1-B(z)" to "-B(z)".

Figure 166-43, title of figure:

Change "1-B(z)" to "-B(z)"

Figure 166-43:

Change "-b[N\_B-2]" to "-b[N\_B-1]" and "-b[N\_B-1]" to "-b[N\_B]".

Eq (166-12):

Change "N\_B-1" to "N\_B".

Cl 166 SC 166.7.8.2.1 P126 L45 # [REDACTED]

Wienckowski, Natalie General Motors Company  
 Comment Type T Comment Status R Equalization filter definition

Inconsistent usage of F and f for the same function.

*SuggestedRemedy*

Change f to F in Equation (166-10), also in Figure 166-42 and Equation (166-12).

Response Response Status C

REJECT.

F(z) and B(z) are polynomials that uniquely specify equalizing filters with coefficients equal to f[i] and b[i], as specified in equations (166-10) and (166-11).

Cl 166 SC 166.7.8.2.1 P126 L49 # [REDACTED]

Wienckowski, Natalie General Motors Company  
 Comment Type T Comment Status R Equalization filter definition

Inconsistent usage of B and b for the same function.

*SuggestedRemedy*

Change b to B in Equation (166-11), also in Figure 166-43 and Equation (166-12).

Response Response Status C

REJECT.

F(z) and B(z) are polynomials that uniquely specify equalizing filters with coefficients equal to f[i] and b[i], as specified in equations (166.10) and (166-11).

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Cl 166 SC 166.7.9 P129 L17 # [REDACTED]

Dawe, Piers

Comment Type E Comment Status A Late

"Receiver sensitivity shall meet" yet at line 44, "The normative requirement for receivers is the stressed receiver sensitivity (see 166.7.10)" as other PMD clauses say – but they also say "Receiver sensitivity (OMAouter) (max) ... is optional" under the receiver table. So is "Receiver sensitivity" normative here or not?

SuggestedRemedy

Clarify

Response Response Status C

ACCEPT IN PRINCIPLE.  
 Page 129 Line 17  
 Page 129 Line 21  
 Page 129 Line 25  
 Page 129 Line 29  
 Page 129 Line 33  
 Change  
 "Receiver sensitivity shall meet Equation (166–20)"  
 to  
 "Receiver sensitivity meets Equation (166–20)"

Cl 166 SC 166.7.10.4 P133 L30 # I-96

Wienckowski, Natalie General Motors Company

Comment Type T Comment Status A Frequency units

As the ranges for f and the equation including f specify kHz, I believe f is in kHz to make the units cancel out.

SuggestedRemedy

Change: f is given in Hz for the equations in the table.  
 To: f is given in kHz for the equations in the table.

Response Response Status C

PROPOSED ACCEPT IN PRINCIPLE  
 Change

"The sinusoidal random jitter is dependent on the frequency as specified in Table 166–19 for 2.5GBASE-AU, 5GBASE-AU, and 10GBASE-AU, and in Table 166–18 for 25GBASE-AU and 50GBASE-AU, where f is given in Hz for the equations in the table."

to

"The sinusoidal random jitter is dependent on the frequency f as specified in Table 166–18 for 2.5GBASE-AU, 5GBASE-AU, and 10GBASE-AU, and in Table 166–19 for 25GBASE-AU and 50GBASE-AU."

Cl 166 SC 166.9.2 P134 L12 # I-99

Wienckowski, Natalie General Motors Company

Comment Type E Comment Status A Connections

Add a note to Figure 166-46 to clarify not all speeds support 4 connections as shown.

SuggestedRemedy

Inset: Note - Not all BASE-AU speeds support 4 connections in the channel as shown in this Figure.

Response Response Status C

ACCEPT IN PRINCIPLE.

Insert: "NOTE - The actual number of connections supported depends on the total connection insertion loss as defined in Table 166-21."

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CI 166 SC 166.9.2.1 P135 L33 # I-170

Dawe, Piers J G

NVIDIA

Comment Type TR Comment Status A Connections

Up to 10 dB of connector loss! This looks like a modal noise problem, unless there is something that ensures that most of this loss is NOT mode selective - which I don't see.

SuggestedRemedy

Reduce the maximum total connection insertion loss or provide rules for what sort of loss is allowed.

Response Response Status U

ACCEPT IN PRINCIPLE.

10 dB is max connections insertion loss for 10, 5 and 2.5 Gb/s. Part of this insertion loss is attributed to be mode selective, therefore, to cause modal noise. In Table 166-11, channel insertion loss is consistent with Table 166-21. Channel insertion loss of Table 166-11 considers 0.1 dB max (0.08 rounded) fiber attenuation and allocation of 0.4 dB for cable attenuation penalty due to aging.

Contribution

[https://www.ieee802.org/3/cz/public/3\\_aug\\_2021/perezaranda\\_3cz\\_01a\\_030821\\_link\\_budget\\_proposal.pdf](https://www.ieee802.org/3/cz/public/3_aug_2021/perezaranda_3cz_01a_030821_link_budget_proposal.pdf) shows:

\* Modal noise impact in receiver sensitivity at several rates

\* Modal noise vs mode selective loss based on

[https://www.ieee802.org/3/cz/public/15\\_jun\\_2021/pinzon\\_3cz\\_01\\_150621.pdf](https://www.ieee802.org/3/cz/public/15_jun_2021/pinzon_3cz_01_150621.pdf)

\* Calculation of min non-MSL IL for inline connections and therefore max MN, and RX sensitivity as a function of MSL IL

Based on this, allocation for modal noise is calculated for all the data-rates

The 802.3cz project has considered much higher insertion loss in the inline connections than the BASE-SR projects. Reasons behind:

\* It is not clear that physical contact connection will be able to meet environmental (e.g. grease, dust conditions, metallic particles, in car automated assembly plant, or a garage) and mechanical (e.g. vibrations, scoop proof) requirements with the cost constraints of automotive application.

\* During more than two decades, SI-POF has been used in automotive applications (e.g. MOST, 1000BASE-RHC), implementing butt-coupling with air-gap in inline connections to avoid end face surfaces of fiber are damaged by mechanical and environmental conditions.

\* Expanded beam optics, physical contact, and air gap connections are under consideration by connector makers to supply a robust, low cost, and fully automated terminated optical connectivity technology to automotive industry based on OM3 fiber.

\* 802.3cz PHYs support the highest technically feasible insertion loss that enable OM3 can be accepted by the automotive industry in terms of performance, environmental and mechanical conditions, and cost.

In Table 166-11, the row of allocation for penalties includes modal noise plus macro-

bending loss (0.2 dB).

Page 118 line 49:

Change footnote c: "Link penalties are used for link budget calculations. They are not requirements and are not meant to be tested." to "The allocation for penalties considers addition of two factors, the receiver sensitivity loss caused by modal noise and the macro-bending loss. Maximum macro-bending loss budgeted is 0.2 dB."

CI 166 SC 166.14.1 P138 L11 # I-102

Wienckowski, Natalie

General Motors Company

Comment Type E Comment Status A Temperature grades

I believe the temperature grades are based on the AEC-Q100 definition. This is missing.

SuggestedRemedy

Change: shall clearly indicate the temperature grade of Table 166-23

To: shall clearly indicate the AEC-Q100 temperature grade as shown in Table 166-23

Add 1.3 Norative references and in it add

AEC - Q100: Failure Mechanism Based Stress Test Qualification For Integrated Circuits

Response Response Status C

ACCEPT IN PRINCIPLE.

Although currently the temperature grades are the same as defined in AEC-Q100, eventual changes to the AEC-Q100 specification may lead to a maintenance requirement to change IEEE 802.3 document.

The Editor believes it is more practical to keep both temperature grade definitions separate, but with the same values at the date of publication of the standard.

Page 138 line 11,

Change "temperature grades" to "temperature classes"

CI 166 SC 166.14.1 P138 L17 # I-2

Pardo, Carlos

Knowledge Development for POF SL

Comment Type E Comment Status A Temperature grades

Bottom temperature comment (a) of "Table 166-23" should apply to both table columns ( Low and High temperature).

SuggestedRemedy

Either put the (a) in both column headers, or placed it on the Table title.

Response Response Status C

ACCEPT IN PRINCIPLE.

Place reference to footnote (a) on the title.

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Cl **166A** SC **166A.2** P**156** L**38** # **[-171]**

Dawe, Piers J G NVIDIA  
 Comment Type **E** Comment Status **R** Layout

Table is hard to use because it is split over two pages; font too small.

*SuggestedRemedy*

Adjust the orphan rows setting for the three tables in the annexes so that they stay together on one page. It looks like the 7 point entries can be changed to 8 point.

Response Response Status **C**

REJECT.

Pagination (including splitting a table) is automated in the document preparation software, and splits such as this will change with addition or deletion of draft content. Thus, such items are best addressed during publication preparation. Guidance on comments in SASB Operations Manual 5.4.3.3 states, "It should be borne in mind that proposed standards are professionally edited prior to publication."

Cl **166B** SC **166B.2** P**160** L**31** # **[-172]**

Dawe, Piers J G NVIDIA  
 Comment Type **E** Comment Status **A** EZ -Pull to discuss

Table title should include "example"

*SuggestedRemedy*

Example RS-FEC(544,522) codeword  
 or  
 RS-FEC(544,522) codeword example

Response Response Status **C**

ACCEPT IN PRINCIPLE.  
 Change  
 "RS-FEC(544,522) codeword"  
 to  
 "RS-FEC(544,522) codeword example"

Cl **Introdu** SC **Introduction** P**10** L**2** # **[-14]**

Torres, Luis Knowledge Development for Plastic Optical Fiber  
 Comment Type **E** Comment Status **A** Title

The name of the amendment does not match with the one given in page 1

*SuggestedRemedy*

Add "using Graded-Index Glass Optical Fiber" after "Automotive Ethernet"

Response Response Status **C**

ACCEPT IN PRINCIPLE.  
 [Page 1 line 11,  
 Page 21 line 10,  
 Page 10 line 4 (boxed paragraph):]  
 Change "Physical Layer Specifications and Management Parameters for Multi-Gigabit Optical Automotive Ethernet."  
 to "Physical Layer Specifications and Management Parameters for Multi-Gigabit Glass Optical Fiber Automotive Ethernet"