*Cl* **FM** *SC* **FM** *P* **1** *L* **10** # 473

Dawe, Piers
Nvidia

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

Missing amendment number

*SuggestedRemedy*

Insert amendment number or a placeholder; here, p 10 L 4, p 26 L 3

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Update spec to reflect this is ammendment #14.

---

*Cl* **FM** *SC* **FM** *P* **1** *L* **32** # 474

Dawe, Piers
Nvidia

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

IEEE Std 802.3yy-20xx

*SuggestedRemedy*

Add the known amendments, as listed in pages 11 to 13, keeping this placeholder or not as appropriate

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **FM** *SC* **FM** *P* **1** *L* **32** # 475

Dawe, Piers
Nvidia

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

"The purpose of the amendment is to add" is not the usual language

*SuggestedRemedy*

Follow precedent where appropriate.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change: The purpose of the amendment is to add

To: This amendment adds

---

*Cl* **FM** *SC* **FM** *P* **1** *L* **34** # 255

Steve, Gorshe
Microchip Technology

*Comment Type* **TR** *Comment Status* **A** *7.5G*

Add a 7.5 Gb/s HS PHY option

*SuggestedRemedy*

Add 7.5 Gb/s support according to changes proposed in https://www.ieee802.org/3/dm/public/adhoc/060226/gorshe_3dm_02_D2d0_7d5G-comments.pdf (also attached), with editorial license.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by comment #357.

---

*Cl* **FM** *SC* **FM** *P* **1** *L* **34** # 273

Pan, Chunpo
Broadcom

*Comment Type* **TR** *Comment Status* **A** *7.5G*

In Clause 192, add a 7.5 Gb/s HS PHY option

*SuggestedRemedy*

Add 7.5 Gb/s HS PHY support according to changes proposed in https://www.ieee802.org/3/dm/public/adhoc/060226/gorshe_3dm_02_D2d0_7d5G-comments.pdf

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by comment #357.

---

*Cl* **FM** *SC* **FM** *P* **1** *L* **34** # 265

Chini, Ahmad
Broadcom

*Comment Type* **TR** *Comment Status* **A** *7.5G*

Add a 7.5 Gb/s HS PHY option for use with Clause 192

*SuggestedRemedy*

Add 7.5 Gb/s support according to changes proposed in https://www.ieee802.org/3/dm/public/adhoc/060226/gorshe_3dm_02_D2d0_7d5G-comments.pdf, with editorial license.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by comment #357.

*Cl* **FM** *SC* **FM** *P* **1** *L* **34** # 267

Lou, Wei
Broadcom

*Comment Type* **TR** *Comment Status* **A** *7.5G*

Add a 7.5 Gb/s HS PHY option in 802.3 Clause 192.

*SuggestedRemedy*

Add 7.5 Gb/s HS PHY support according to changes proposed in https://www.ieee802.org/3/dm/public/adhoc/060226/gorshe_3dm_02_D2d0_7d5G-comments.pdf

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by comment #357.

*Cl* **FM** *SC* **FM** *P* **1** *L* **34** # 270

Tu, Mike
Broadcom

*Comment Type* **TR** *Comment Status* **A** *7.5G*

The 7.5 Gb/s speed should be added to Clause 192 as a high speed option.

*SuggestedRemedy*

Adopt the proposed changes as shown in "https://www.ieee802.org/3/dm/public/adhoc/060226/gorshe_3dm_02_D2d0_7d5G-comments.pdf".

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by comment #357.

*Cl* **FM** *SC* **FM** *P* **2** *L* **1** # 476

Dawe, Piers
Nvidia

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

This material should appear on the first page.

*SuggestedRemedy*

Reduce the font size, line spacing and/or space after the title on the first page as needed

*Response* *Response Status* **C**

REJECT.

This goes onto the 2nd page in many drafts including, 3dj, 3dg, 3da, etc.

*Cl* **FM** *SC* **FM** *P* **3** *L* **1** # 477

Dawe, Piers
Nvidia

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

Abstract and keywords should appear on the page with the special footer beginning "The Institute of Electrical and Electronics Engineers, Inc."

*SuggestedRemedy*

Move the abstract and keywords to the right place

*Response* *Response Status* **C**

REJECT.

This is the same as other drafts including, 3dj, 3dg, etc.

*Cl* **FM** *SC* **FM** *P* **3** *L* **2** # 275

Pan, Chunpo
Broadcom

*Comment Type* **TR** *Comment Status* **D** *1G*

In Clause 192, add 5 Gb/s HS and 1000 Mb/s LS PHY options

*SuggestedRemedy*

Add 5 Gb/s HS PHY and 1000 Mb/s LS PHY support according to changes proposed in https://www.ieee802.org/3/dm/public/adhoc/060226/chini_3dm_02a_D2d0_1G_comments-preview.pdf

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Accommodated by comment #358.

*Cl* **FM** *SC* **FM** *P* **3** *L* **2** # 266

Chini, Ahmad
Broadcom

*Comment Type* **TR** *Comment Status* **D** *1G*

Add a 7.5 Gb/s HS with 1Gb/s LS option to the Clause 192
Add a 5.0 Gb/s HS with 1Gb/s LS option to the Clause 192

*SuggestedRemedy*

Add 7.5 Gb/s HS with 1Gb/s LS and 5Gs/s HS with 1Gb/s LS support according to changes proposed in chini_3dm_02a_D2d0_1G_comments-preview.pdf, with editorial license.

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Accommodated by comment #358.

*Cl* **FM** *SC* **FM** *P* **3** *L* **2** # 268

Lou, Wei
Broadcom

*Comment Type* **TR** *Comment Status* **R** *1G*

Add a 7.5 Gb/s HS PHY and 1000 Mb/s LS PHY option in 802.3 Clause 192.

*SuggestedRemedy*

Add 7.5 Gb/s HS PHY and 1000 Mb/s LS PHY support according to changes proposed in https://www.ieee802.org/3/dm/public/adhoc/060226/chini_3dm_02a_D2d0_1G_comments-preview.pdf

*Response* *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Accommodated by comment #358.

*Cl* **FM** *SC* **FM** *P* **3** *L* **2** # 269

Lou, Wei
Broadcom

*Comment Type* **TR** *Comment Status* **R** *1G*

Add a 5 Gb/s HS and 1000 Mb/s LS PHY option in 802.3 Clause 192.

*SuggestedRemedy*

Add 5 Gb/s HS PHY and 1000 Mb/s LS PHY support according to changes proposed in https://www.ieee802.org/3/dm/public/adhoc/060226/chini_3dm_02a_D2d0_1G_comments-preview.pdf

*Response* *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Accommodated by comment #358.

*Cl* **FM** *SC* **FM** *P* **3** *L* **2** # 271

Tu, Mike
Broadcom

*Comment Type* **TR** *Comment Status* **R** *1G*

The 7.5 Gb/s high speed and 1000 Mb/s low speed option should be added to Clause 192.

*SuggestedRemedy*

Adopt the proposed changes as shown in "https://www.ieee802.org/3/dm/public/adhoc/060226/chini_3dm_02a_D2d0_1G_comments-preview.pdf".

*Response* *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Accommodated by comment #358.

*Cl* **FM** *SC* **FM** *P* **3** *L* **2** # 274

Pan, Chunpo
Broadcom

*Comment Type* **TR** *Comment Status* **D** *1G*

In Clause 192, add 7.5 Gb/s HS PHY and 1000 Mb/s LS PHY options

*SuggestedRemedy*

Add 7.5 Gb/s HS PHY and 1000 Mb/s LS PHY support according to changes proposed in https://www.ieee802.org/3/dm/public/adhoc/060226/chini_3dm_02a_D2d0_1G_comments-preview.pdf

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Accommodated by comment #358.

*Cl* **FM** *SC* **FM** *P* **3** *L* **2** # 256

Steve, Gorshe — Microchip Technology

*Comment Type* **T** *Comment Status* **R** *1G*

Add support for a 1 Gb/s LS PHY option for use with 5 and 7.5 Gb/s HS

*SuggestedRemedy*

Add 1 Gb/s support according to the changes proposed in chini_3dm_02a_D2d0_comments-preview.pdf in the June 2 ad hoc meeting folder https://ieee802.org/3/dm/public/adhoc/060226

*Response* *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **FM** *SC* **FM** *P* **3** *L* **2** # 272

Tu, Mike — Broadcom

*Comment Type* **TR** *Comment Status* **R** *1G*

The 5 Gb/s high speed and 1000 Mb/s low speed option should be added to Clause 192.

*SuggestedRemedy*

Adopt the proposed changes as shown in "https://www.ieee802.org/3/dm/public/adhoc/060226/chini_3dm_02a_D2d0_1G_comments-preview.pdf".

*Response* *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Accommodated by comment #358.

*Cl* **FM** *SC* **FM** *P* **3** *L* **4** # 257

Steve, Gorshe — Microchip Technology

*Comment Type* **E** *Comment Status* **R** *EZ - pull*

Add MultiG PHYs to the list

*SuggestedRemedy*

Add 100M+MultiGBASE-T1, 100M+MultiGBASE-V1, MultiG+100MBASE-T1 and MultiG+100MBASE-V1 to the list

*Response* *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **FM** *SC* **FM** *P* **3** *L* **7** # 138

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

-AT1 and -AV1 PHY types need to be added to the list of Keywods.

*SuggestedRemedy*

Add to the list of Keywords: MultiGBASE-AT1 and MultiGBASE-AV1

*Response* *Response Status* **C**

ACCEPT.

*Cl* **FM** *SC* **FM** *P* **13** *L* **10** # 20

Ran, Adee — Cisco Systems

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

802.3dk-2026 was approved in March 2026

*SuggestedRemedy*

Change 202x to 2026

*Response* *Response Status* **C**

ACCEPT.

*Cl* **FM** *SC* **FM** *P* **13** *L* **10** # 479

Dawe, Piers Nvidia

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

802.3dk is published now

*SuggestedRemedy*

Change 202x to 2026

*Response* *Response Status* **C**

ACCEPT.

*Cl* **FM** *SC* **FM** *P* **13** *L* **16** # 21

Ran, Adee Cisco Systems

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

The amendments list does not include 802.3dj and 802.3dr, which are both expected to complete before 802.3dm.

*SuggestedRemedy*

Add the missing amendments 802.3dr-2026 and 802.3dj-202x, with abstracts based on the latest drafts respectively.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Make the requested change.

Rquest the FM template be updated to include the additional drafts. It hasn't been updated since January 2025.

*Cl* **FM** *SC* **FM** *P* **13** *L* **24** # 237

Muma, Scott Microchip Technology Inc.

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

Clause 200 is mentioned but not part of the draft amendment.

*SuggestedRemedy*

Change Clause 200 to appropriate close number(s) with editorial license.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

See #139.

*Cl* **FM** *SC* **FM** *P* **13** *L* **24** # 480

Dawe, Piers Nvidia

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

Clause 200 - not

*SuggestedRemedy*

Clause 191, Clause 192 and Annex 191A

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by #139.

*Cl* **FM** *SC* **FM** *P* **13** *L* **24** # 139

Wienckowski, Natalie IVN Solutions LLC; Ethernovia & Bosch

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

The Clause numbers weren't updated.

*SuggestedRemedy*

Change: Clause 200
To: Clauses 191 and 192 and Annex 191A.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **FM** *SC* **FM** *P* **13** *L* **25** # 235

Muma, Scott Microchip Technology Inc.

*Comment Type* **TR** *Comment Status* **A** *7.5G*

Add a 7.5 Gb/s HS PHY option for use with Clause 192

*SuggestedRemedy*

Add 7.5 Gb/s support according to changes proposed in gorshe_3dm_02_D2d0_7d5G-comments.pdf in the June 2 ad hoc meeting folder https://ieee802.org/3/dm/public/adhoc/060226, with editorial license.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by comment #357.

*Cl* **FM** *SC* **FM** *P* **13** *L* **25** # 236

Muma, Scott — Microchip Technology Inc.

*Comment Type* **TR** *Comment Status* **D** *1G*

Add support to Clause 192 for a 1 Gb/s LS PHY option for use with 5 and 7.5 Gb/s HS

*SuggestedRemedy*

Add 1 Gb/s support according to the changes proposed in chini_3dm_02a_D2d0_comments-preview.pdf in the June 2 ad hoc meeting folder https://ieee802.org/3/dm/public/adhoc/060226, with editorial license.

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Accommodated by comment #358.

*Cl* **FM** *SC* **FM** *P* **26** *L* **48** # 481

Dawe, Piers — Nvidia

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

Reviewers and the publication editor need to know which other IEEE 802.3 amendment projects running in parallel that modified the same text and tables the editors have taken into account.

*SuggestedRemedy*

List them here. Preferably, list all the amendment projects running in parallel, in two groups: those that affect this amendment, and those that don't. Also, it is worth providing summary information specifically for, and at the start of, clauses such as Clause 45 where this is most important.

*Response* *Response Status* **W**

REJECT.

This has not been done in any draft I have checked, including all current ammendments to 802.3-2022.

*Cl* **00** *SC* **0** *P* **3** *L* **4** # 478

Dawe, Piers — Nvidia

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

Don't use + within a word, because search engines and similar, and humans, interpret it as plus meaning and, not a letter within a word. This isn't 100BASE-T1 and 2.5GBASE-T1 (for example), nor a thing with two symmetrical rate options, but a distinct PHY. We discovered the problem with SFP+, too late to change that, but there is no need to repeat the same mistake.

*SuggestedRemedy*

Change + to something else e.g. underscore

*Response* *Response Status* **W**

REJECT.

We had a discussion on this in November 2024 where "_" was an option, but it was not preferred. (https://ieee802.org/3/dm/public/1124/wienckowski_3dm_02a_NOV2024.pdf)

In this case, + does mean "and" as both rates are supported, one as tranmsit and the other as receive.

*Cl* **00** *SC* **0** *P* **3** *L* **8** # 385

Maguire, Valerie — Copperopolis; aff'l w/ CME Consulting, Microchip, and

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

MultiGBASE-AT1 and MultiGBASE-AV1 should be added to keywords. Consider order of keywords.

*SuggestedRemedy*

Insert, ", MultiGBASE-AT1, MultiGBASE-AV1" after IEEE 802.3dm™

Move, "automotive Ethernet" to before IEEE 802.3dm™

*Response* *Response Status* **C**

ACCEPT.

*Cl* **00** *SC* **0** *P* **8** *L* # 81

Lusted, Kent — Synopsys

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

Add the ballot committee members

*SuggestedRemedy*

Add the ballot committee members

*Response* *Response Status* **C**

ACCEPT.

*Cl* **1** *SC* **1** *P* **28** *L* **42** # 386

Maguire, Valerie — Copperopolis; aff'l w/ CME Consulting, Microchip, and

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

Update MultiGBASE-A, MultiGBASE-AT1 and MultiGBASE-AV1 definitions to better align with objectives. Correct missing "that transmit" and clarify that speed is less than or equal to 1000 Mb/s in the MultiGBASE-A definition.

*SuggestedRemedy*

Replace definitions of MultiGBASE-A, MultiGBASE-AT1 and MultiGBASE-AV1 with:

1.4.405b MultiGBASE-A: PHYs that belong to the set of specific asymmetric PHYs that transmit at speeds in excess of 1000 Mb/s in one direction and less than or equal to 1000 Mb/s in the other direction, with the direction of asymmetry and high-speed rate determined at link startup for at least one transmission rate, including MultiGBASE-AT1 and MultiGBASE-AV1. (See IEEE Std 802.3, Clause 191.)

1.4.405c MultiGBASE-AT1: IEEE 802.3 Physical Layer specification for an asymmetric rate Ethernet full duplex point-to-point link operating at 2.5 Gb/s, 5 Gb/s, or 10 Gb/s in one direction and 100 Mb/s in the other direction, with the direction of asymmetry and high-speed rate determined at link startup for at least one transmission rate, over a single shielded balanced pair of conductors. (See IEEE Std 802.3, Clause 192.)

1.4.405d MultiGBASE-AV1: IEEE 802.3 Physical Layer specification for an asymmetric rate Ethernet full duplex point-to-point link operating at 2.5 Gb/s, 5 Gb/s, or 10 Gb/s in one direction and 100 Mb/s in the other direction, with the direction of asymmetry and high-speed rate determined at link startup for at least one transmission rate, over a single coaxial conductor. (See IEEE Std 802.3, Clause 192.)

*Response* *Response Status* **C**

ACCEPT.

*Cl* **1** *SC* **1.1.3.2** *P* **170** *L* **3** # 484

Dawe, Piers — Nvidia

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

If 1.4.88 10 Gigabit Media Independent Interface (XGMII) is changing...

*SuggestedRemedy*

1.1.3.2 f) needs revision to match. Page 170 is in the base standard.

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Change current text in 1.1.3.2 f) 10 Gigabit Media Independent Interface (XGMII). The XGMII is designed to connect a 2.5 Gb/s, 5 Gb/s, or 10 Gb/s capable MAC to a PHY of the same rate. While conformance with implementation of this interface is not necessary to ensure communication, it allows maximum flexibility in intermixing PHYs and DTEs at 2.5 Gb/s, 5 Gb/s, and 10 Gb/s speeds.
To: 10 Gigabit Media Independent Interface (XGMII). The XGMII is designed to connect a 2.5 Gb/s, 5 Gb/s, or 10 Gb/s capable MAC to a PHY of the same rate**, or to an asymmetric PHY that supports 2.5 Gb/s, 5 Gb/s, or 10 Gb/s in one direction and 100 Mb/s in the other**. While conformance with implementation of this interface is not necessary to ensure communication, it allows maximum flexibility in intermixing PHYs and DTEs at 2.5 Gb/s, 5 Gb/s, and 10 Gb/s speeds.
The text between ** and ** is new and should be in underline. Add appropriate editor's instruction.

*Cl* **1** *SC* **1.3** *P* **27** *L* **9** # 326

Simms, William — NVIDIA

*Comment Type* **E** *Comment Status* **R** *EZ - pull*

use of british/canadian spelling for 'analogue' is inconsistent with other instances in the document

*SuggestedRemedy*

change analogue to analog

*Response* *Response Status* **C**

REJECT.

This is a listed reference to another spec and this is the spelling used in the title of that spec.

*Cl* **1** *SC* **1.4.2.249** *P* **28** *L* **36** # 259

Steve, Gorshe — Microchip Technology

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

The title and text of 1.4.249a are inconsistent

*SuggestedRemedy*

The title is “MultiG+100MBASE,” which pertains to Clause 192. However, the text contains the enumeration used in Clause 191 along with a reference to that clause. It appears that this clause should be re-written to reflect Clause 192.

*Response* *Response Status* **C**

REJECT.
This applies to 191, not 192. There is no "A" in the name. This is the group of 2.5G/5G/10G+100M PHYs abbreviated as MultiG+100M.

*Cl* **1** *SC* **1.4.26** *P* **27** *L* **15** # 87

Kim, Yong — General Motors

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

Definitions for 802.3 100M+2.5G/5G/10G and 100M+MultiGigBASE are the same whether it is T1 or V1. One may conclude that if the definitions are the same, they are the same. Obviously, intention is to be different. Please correct the definition.

*SuggestedRemedy*

At least, refer to the clauses that differentiate thet T1 and V1. Or other suitable changes to make the definition text different.

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

After "single shielded balanced pair of conductors" add (see 191.9).
After "single unbalanced coaxial cable" add (see 191.10).

*Cl* **1** *SC* **1.4.26** *P* **27** *L* **46** # 88

Kim, Yong — General Motors

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

Definitions for 802.3 2.5G/5G/10G+100M and MultiGigBASE+100M are the same whether it is T1 or V1. One may conclude that if the definitiosn are the same, they are the same. Obviously, intention is to be different. Please correct the definition.

*SuggestedRemedy*

At least, refer to the clauses that differentiate thet T1 and V1. Or other suitable changes to make the definition text different.

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

After "single shielded balanced pair of conductors" add (see 191.9).
After "single unbalanced coaxial cable" add (see 191.10).

*Cl* **1** *SC* **1.4.26** *P* **28** *L* **5** # 89

Kim, Yong — General Motors

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

"including asymmetric PHYs with 100 Mb/s in the reverse direction" is vague. What is reverse direction.

*SuggestedRemedy*

Change to read "The interface between the Reconciliation
Sublayer (RS) and the Physical Coding Sublayer (PCS) for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s operation in both direction, or one of the direction operating at 100 Mbps in asymmetic PHYs. BTW, Pg 47 line 11 in CL46 is clear, as is this remedy.

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

This is on 1.4.88, not 1.4.26.

Change: (including asymmetric PHYs with 100 Mb/s in the reverse direction)

To: (including asymmetric PHYs with
one of these rates in one direction and 100 Mb/s in the other direction)

*Cl* **1** *SC* **1.4.26** *P* **28** *L* **29** # 90

Kim, Yong — General Motors

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

"The electrical and mechanical interface to the shared coaxial cable medium", where "shared" is stricken is problematic for 10BASE5, 10BASE2, and 10Broad36, MAU ("PHY").

*SuggestedRemedy*

Reverse the change and define coax cable P2P or approprate definitoin for asymettic phy over coax.

*Response* *Response Status* **W**

REJECT.

This comment is on 1.4.249, not 1.4.26.

Striking "shared" does not mean it can't be used as a "shared" medium.

*Cl* **1** *SC* **1.4.27** *P* **28** *L* **45** # 91

Kim, Yong — General Motors

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

"1.4.405c MultiGBASE-AT1" and "1.4.405d MultiGBASE-AV1" definitions have exactly the same text definition. One may conclude that if the definitions are the same, they are the same.

*SuggestedRemedy*

At least, refer to the clauses that differentiate thet T1 and V1. Or other suitable changes to make the definition text different.

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

After "single shielded balanced pair of conductors" add (see 192.7).
After "single unbalanced coaxial cable" add (see 192.8).

*Cl* **1** *SC* **1.4.46** *P* **27** *L* **40** # 258

Steve, Gorshe — Microchip Technology

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

The title of 1.4.46g is inconsistent with the text

*SuggestedRemedy*

The title is “100M+MultiGBASE,” which pertains to Clause 192. However, the text contains the enumeration used in Clause 191 along with a reference to that clause. It appears that this clause should be re-written to reflect Clause 192.

*Response* *Response Status* **C**

REJECT.

This applies to 191, not 192. There is no "A" in the name. This is the group of 100M+2.5G/5G/10G PHYs abbreviated as 100M+MultiG.

*Cl* **1** *SC* **1.4.46a** *P* **27** *L* **15** # 482

Dawe, Piers — Nvidia

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

"link supporting transmission at X b/s and reception at Y b/s over a single ..." has problems. The link is bidirectional; it does not have a "transmission" and "reception" direction, but the PHYs and Physical Layers on the ends do. The PHYs do not "support" transmission and reception, they do these things, i.e. they transmit and receive. Clause 45 uses better language such as "operate" or "perform".
According to 1.1.2.2 Full duplex is always point-to-point.
Compare the language in 1.4.46g 100M+MultiGBASE.

*SuggestedRemedy*

IEEE 802.3 specification for an asymmetric full duplex Ethernet Physical Layer for point-to-point transmission at 100 Mb/s and reception at 10 Gb/s over a single shielded balanced pair of conductors. (See IEEE Std 802.3, Clause 191.)
or
IEEE 802.3 specification for an asymmetric full duplex Ethernet Physical Layer transmitting at 100 Mb/s and receiving at 10 Gb/s over a single shielded balanced pair of conductors. (See IEEE Std 802.3, Clause 191.)
And similarly.

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Implement the first option.

*Cl* **1** *SC* **1.4.46g** *P* **27** *L* **39** # 483

Dawe, Piers Nvidia

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

I notice that most of these definitions are for "Physical Layer specification"s while this one and the later MultiG ones are for PHYs. I don't see a definition of e.g. 100M+10GBASE-T1 PHY in this section.

*SuggestedRemedy*

Please review and clarify.

*Response* *Response Status* **W**

REJECT.

This is consistent with IEEE 802.3 style, see 1.4.406 and 1.4.407 and compare those to 1.4.82 and 1.4.83 which are 10GBASE-T and 10GBASE-T1.

The individual PHY definitions are "IEEE 802.3 Physical Layer specification" and the family of PHYs is "PHYs that belong to the set ...".

*Cl* **1** *SC* **1.4.46g** *P* **27** *L* **40** # 327

Simms, William NVIDIA

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

1000 Mb/s used is inconsistent with 1 Gb/s langauge used on same page.

*SuggestedRemedy*

change 1000 Mb/s to 1 Gb/s

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change 1 Gb/s to 1000 Mb/s.

We have 1000BASE, not 1GBASE PHYs.

*Cl* **1** *SC* **1.4.249** *P* **28** *L* **37** # 328

Simms, William NVIDIA

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

1000 Mb/s used is inconsistent with 1 Gb/s langauge used on same page.

*SuggestedRemedy*

change 1000 Mb/s to 1 Gb/s

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change 1 Gb/s to 1000 Mb/s.

We have 1000BASE, not 1GBASE PHYs.

*Cl* **1** *SC* **1.4.405** *P* **28** *L* **43** # 260

Steve, Gorshe Microchip Technology

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

Incorrect clause reference in 1.4.405b

*SuggestedRemedy*

The reference should be to Clause 192 rather than 191

*Response* *Response Status* **C**

ACCEPT.

*Cl* **1** *SC* **1.4.405** *P* **28** *L* **43** # 329

Simms, William NVIDIA

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

1000 Mb/s used is inconsistent with 1 Gb/s langauge used on same page.

*SuggestedRemedy*

change 1000 Mb/s to 1 Gb/s

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change 1 Gb/s to 1000 Mb/s.

We have 1000BASE, not 1GBASE PHYs.

*Cl* **1** *SC* **1.4.405b** *P* **28** *L* **41** # 82

Lusted, Kent — Synopsys

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

The defintion for MultiGBASE-A references Clause 191 in the (). However, the PCS PMD and medium description of MultiGBASE-A is in Clause 192.

*SuggestedRemedy*

Change "(See IEEE Std 802.3, Clause 191.)" to
"(See IEEE Std 802.3, Clause 192.)"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **1** *SC* **1.5** *P* **29** *L* **1** # 144

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

ACT and TDD were added as abreviations when these were included in the Clause names. These have been removed from the Clause names.

*SuggestedRemedy*

Delete 1.5 and its contents.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Delete ACT entry.

Keep TDD and change: Time Division Duplex to: time-division duplex

*Cl* **1** *SC* **1.5** *P* **29** *L* **6** # 92

Kim, Yong — General Motors

*Comment Type* **ER** *Comment Status* **R** *EZ - pull*

"TDD". Time Division Duplex is unclear. I heard and referred to "TDD" so long that I did not question it unitl revewing the draft. "Duplex" is misnomer and sounds more marketing. Time Division Multiplex, or Time Divisoin Simplex woule be more correct and be more aligned with common reference to this type of technique. Why create confusion by creating a new term when perfectly well-understood term is available.

*SuggestedRemedy*

Consider TDM, which is more well-understood term for this operation.

*Response* *Response Status* **W**

REJECT.

CRG disagrees with commenter as this is the term used in Clause 192. This is consistent with the general uderstanding of this term.

*Cl* **30** *SC* **30.3.2.1.3a** *P* **31** *L* **20** # 382

Maguire, Valerie — Copperopolis; aff'l w/ CME Consulting, Microchip, and

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

Missing indent.

*SuggestedRemedy*

Insert hanging indent so that LS-PATH wraps correctly

*Response* *Response Status* **C**

ACCEPT.

*Cl* **45** *SC* **45.2.1** *P* **33** *L* **8** # 22

Ran, Adee — Cisco Systems

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

Typo: throug

*SuggestedRemedy*

Change to through

*Response* *Response Status* **C**

ACCEPT.

*Cl* **45** *SC* **45.2.1** *P* **33** *L* **9** # 332

Wang, Frank — Realtek Semiconductor Corp.

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

typo

*SuggestedRemedy*

change "throug" to "through"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **45** *SC* **45.2.1** *P* **33** *L* **22** # 187

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

Add note to registers to indicate they are also used for -V1 type PHYs.

*SuggestedRemedy*

Add the following, existing, registers in Table 45-3 (1.2309, 1.2310, 1.2314, 1.2315, 1.2316, 1.2317). Add a "b" superscript to the name.
Add note "b" at the end of the table: This register also applies to all MutltiG type -V1 PHYs.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **45** *SC* **45.2.1.7.4** *P* **34** *L* **22** # 189

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

Add transmit fault reference to Clause 192

*SuggestedRemedy*

Change Editor's note to to add: and insert a new row at the end of the table.
Add new row at the end of the table: MultiGBASE-AT1, MultiGBASE-AV1 | 192.4.2.2.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **45** *SC* **45.2.1.7.4** *P* **34** *L* **22** # 51

Muma, Scott — Microchip

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

Add row to table 45–9 for MultiGBASE-AT1, MultiGBASE-AV1 transmit fault description location 202.4.2.2

*SuggestedRemedy*

As per comment

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by #189.

*Cl* **45** *SC* **45.2.1.7.5** *P* **34** *L* **30** # 333

Wang, Frank — Realtek Semiconductor Corp.

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

insert a space between "table" and "("

*SuggestedRemedy*

change "table(unchanged" to "table (unchanged"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **45** *SC* **45.2.1.10** *P* **35** *L* **1** # 334

Wang, Frank — Realtek Semiconductor Corp.

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

remove period

*SuggestedRemedy*

change "shown.)" to "shown)"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **45** *SC* **45.2.1.10** *P* **35** *L* **9** # 95

Huber, Thomas — Nokia

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

In table 45-14, V1 is being added to the name, but this is not shown as a change

*SuggestedRemedy*

Underline the "/V1" in "Base-T1/V1 extended abilities"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **45** *SC* **45.2.1.16** *P* **36** *L* **5** # 140

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

update Editor's instructions

*SuggestedRemedy*

Change: and insert new row 3
To: and insert new rows 3 and 4

*Response* *Response Status* **C**

ACCEPT.

*Cl* **45** *SC* **45.2.1.16** *P* **36** *L* **14** # 96

Huber, Thomas — Nokia

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

The editing instruction notes that the text of row 2 is to be changed relative to the base standard, as modified by 802.3cy, 802.3da, and 802.3dg. In 802.3dg, the reserved bits are 15:10 rather than 15:7. While the final text is correct, it may be confusing to readers to see bit 7 replcaed with bit 12 in the second row, but only bits 10 and 11 being added in the new rows.

*SuggestedRemedy*

Change the Bit(s) column in the second row to show a 10 in strikethrough rather than a 7, or include the rows defining bits 7-9 in the table as unchanged rows (in which case the rows being added for bits 10 and 11 should be underlined)

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change the reserved row to 1.18:15:_12_ -9-

Where _12_ means "12" underlined.
Where -9- means "9" in strikethrough.

*Cl* **45** *SC* **45.2.1.16** *P* **36** *L* **27** # 141

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

update Editor's instructions

*SuggestedRemedy*

Change: 45.2.1.16.aaaa
To: 45.2.1.16.aaaa and 45.2.1.16.aaab

*Response* *Response Status* **C**

ACCEPT.

*Cl* **45** *SC* **45.2.1.16** *P* **36** *L* **44** # 142

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

update Editor's instructions

*SuggestedRemedy*

Change: 45.2.1.60f
To: 45.2.1.60f and subclauses and table 45-58f.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **45** *SC* **45.2.1.60f** *P* **36** *L* **44** # 97

Huber, Thomas — Nokia

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

In the editing instruction, subclause 45.2.1.60e was added by 802.3dj rather than 802.3df.

*SuggestedRemedy*

Change 802.3df to 802.3dj

*Response* *Response Status* **C**

ACCEPT.

*Cl* **45** *SC* **45.2.1.214** *P* **40** *L* **5** # 297

Simms, William — NVIDIA

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

The instruction is to replace rows for bits 1.2100.13:4 and 1.2100.3:0 but the table is 1.2100.13:5 and 1.2100.4:0

*SuggestedRemedy*

Need to correct either the instruction or the table to reconcile the change

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Change: Replace the rows for bits 1.2100.13:4 and 1.2100.3:0 in Table 45–178

Change: In Table 45–178, replace the rows for bits 1.2100.13:4 and 1.2100.3:0, with the rows for bits 1.2100.13:5 and 1.2100.4:0.

*Cl* **45** *SC* **45.2.1.214** *P* **40** *L* **19** # 298

Simms, William — NVIDIA

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

visually, it looks like there is a space between the T and the 1 in MultiGBASE-AT1. I don't see a space when I select the text but visually it seems to be there.

*SuggestedRemedy*

check if there is a spece present between the T and the 1

*Response* *Response Status* **C**

REJECT.

There is not a space. It's related to the spacing of the different characters.

*Cl* **45** *SC* **45.2.1.244.1** *P* **40** *L* **51** # 184

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

missing register that needs to be updated for 191

*SuggestedRemedy*

Bring in this section from 802.3, as modified by 802.3cy and add references to 191.3.2.2.14, 191.5.2.4.5 and 191.5.2.5.4, with editorial license.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **45** *SC* **45.2.1.245.1** *P* **40** *L* **51** # 185

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

missing register that needs to be updated for 191

*SuggestedRemedy*

Bring in this section from 802.3, as modified by 802.3cy and add references to 191.3.2.2.14, 191.5.2.4.5 and 191.5.2.5.4 , with editorial license.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **45** *SC* **45.2.1.246** *P* **40** *L* **51** # 186

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

missing register that needs to be updated for 191

*SuggestedRemedy*

Bring in this section from 802.3, as modified by 802.3cy and add appropriate references, with editorial license.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **45** *SC* **45.2.1.250** *P* **40** *L* **13** # 485

Dawe, Piers — Nvidia

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

In most of 802.3, except for old 8B/10B style sections, we use Rx for receiver and Tx for transmitter. TX, as well as being part of 100BASE-TX, means Texas.

*SuggestedRemedy*

Change RX to Rx and TX to Tx throughut the document except in names where ALL CAPs are used, such as RX_CLK.

*Response* *Response Status* **W**

ACCEPT.

*Cl* **45** *SC* **45.2.1.250** *P* **44** *L* **43** # 261

Steve, Gorshe — Microchip Technology

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

Typo error in the text associated with each of the 45.2.1.250c sub-clauses on pages 44-45.

*SuggestedRemedy*

In the text for each 45.2.1.1.250c.x sub-clause, change the register bit reference to be the same as in the sub-clause title rather than a reference back to Table 45-212a.

*Response* *Response Status* **W**

ACCEPT.

*Cl* **45** *SC* **45.2.1.250** *P* **45** *L* **7** # 242

Steve, Gorshe — Microchip Technology

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

Sub-clause 45.2.1.250c.4 title and text point to an incorrect register value

*SuggestedRemedy*

Change 1.2318.8 to 1.2320.8

*Response* *Response Status* **W**

ACCEPT.

*Cl* **45** *SC* **45.2.1.250a** *P* **41** *L* **6** # 98

Huber, Thomas Nokia

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

802.3dj is already inserting table 45-212a in subclause 45.2.1.250

*SuggestedRemedy*

Change Table 45-212a to Table 45-212aa. Make the same change in the title of the table.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by #99.

The table should be 45-212ab

*Cl* **45** *SC* **45.2.1.250a** *P* **41** *L* **35** # 299

Simms, William NVIDIA

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

missing space in description column between 5 and Gb/s. Inconsistent with rest of table

*SuggestedRemedy*

add space between 5 Gb/s

*Response* *Response Status* **C**

ACCEPT.

*Cl* **45** *SC* **45.2.1.250a** *P* **41** *L* **37** # 300

Simms, William NVIDIA

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

missing space in description column between 2.5 and Gb/s. Inconsistent with rest of table

*SuggestedRemedy*

add space between 2.5 Gb/s

*Response* *Response Status* **C**

ACCEPT.

*Cl* **45** *SC* **45.2.1.250b** *P* **42** *L* **43** # 301

Simms, William NVIDIA

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

There's a mismatch somewhere here. The Table 45-212a is rate ability register definitions and 45-212b is rate negotiation definitions. I suspect either the title is wrong or the pointer is to the wrong table

*SuggestedRemedy*

refer to table 45-212b instead?

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Accommodated by #99.

The table should be 45-212ab

*Cl* **45** *SC* **45.2.1.250b** *P* **42** *L* **45** # 99

Huber, Thomas Nokia

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

The table for the PMA assignments should be 45-212ab rather than 45-212a

*SuggestedRemedy*

Change Table 45-212a to Table 45-212ab. Change the title of the table itself (on the following page) from 45-212b to 45-212ab.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **45** *SC* **45.2.1.250b.1** *P* **42** *L* **50** # 389

Maguire, Valerie Copperopolis; aff'l w/ CME Consulting, Microchip, and

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

Missing commas.

*SuggestedRemedy*

Change, "When bits 1.2319:5:4 are 00 negotiation of the PHY_D transmit rate is in progress."

to: "When bits 1.2319:5:4 are 00, negotiation of the PHY_D transmit rate is in progress."

Grant Editorial license to review and correct this is all clause 45 bit clauses.

*Response* *Response Status* **C**

ACCEPT.

Cl **45** SC **45.2.1.250b.2** P **43** L **25** # 302

Simms, William NVIDIA

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

incorrect bits and bit amount called out "When bits 1.2319:5:4" 000 when only 2-bits called out. Likely a typo carried forward from prior register text

*SuggestedRemedy*

should be "When bits 1.2319:3:1"

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Change: 1.2319.5:4
To: 12319.3:1

---

Cl **45** SC **45.2.1.250b.2** P **43** L **43** # 390

Maguire, Valerie Copperopolis; aff'l w/ CME Consulting, Microchip, and

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

Numbers less than ten should be spelled out. Insert comma per another Maguire comment.

*SuggestedRemedy*

Change, "When bit 1.2319.0 is 1 the LEADER..."

to: "When bit 1.2319.0 is one, the LEADER...."

Change, "When bit 1.2319.0 is 0 the LEADER..."

to: "When bit 1.2319.zero, the LEADER...."

Grant Editorial license to review and correct this is all clause 45 bit clauses.

*Response* *Response Status* **C**

ACCEPT.

---

Cl **45** SC **45.2.1.250b.3** P **43** L **34** # 303

Simms, William NVIDIA

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

no period at end of sentence

*SuggestedRemedy*

PHY_S mode.

*Response* *Response Status* **W**

ACCEPT.

---

Cl **45** SC **45.2.1.250c** P **43** L **39** # 100

Huber, Thomas Nokia

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

The table should be 45-212ac

*SuggestedRemedy*

Change Table 45-212c to Table 45-212ac. Make the same change in the title of the table.

*Response* *Response Status* **C**

ACCEPT.

---

Cl **45** SC **45.2.1.250c.0** P **45** L **33** # 312

Simms, William NVIDIA

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

mismatch in title bit called out versus text

*SuggestedRemedy*

change bit 1.2318.0 to 1.2320.0, two instances

*Response* *Response Status* **W**

ACCEPT.

---

Cl **45** SC **45.2.1.250c.1** P **44** L **40** # 306

Simms, William NVIDIA

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

mismatch in title bit called out versus text

*SuggestedRemedy*

change bit 1.2318.15 to 1.2320.15, two instances

*Response* *Response Status* **W**

ACCEPT.

---

Cl **45** SC **45.2.1.250c.1** P **44** L **42** # 101

Huber, Thomas Nokia

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

In this clause and all the other 45.2.1.250c.* clauses, the bit numbers should be 1.2320.x rather than 1.2318.x.

*SuggestedRemedy*

Change 1.2318 to 1.2320 in all 45.2.1.250c.x subclauses

*Response* *Response Status* **C**

ACCEPT.

Cl **45** SC **45.2.1.250c.2** P **44** L **48** # 307

Simms, William NVIDIA

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

mismatch in title bit called out versus text

*SuggestedRemedy*

change bit 1.2318.13 to 1.2320.13, two instances

*Response* *Response Status* **W**

ACCEPT.

Cl **45** SC **45.2.1.250c.3** P **45** L **3** # 308

Simms, William NVIDIA

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

mismatch in title bit called out versus text

*SuggestedRemedy*

change bit 1.2318.12 to 1.2320.12, two instances

*Response* *Response Status* **W**

ACCEPT.

Cl **45** SC **45.2.1.250c.4** P **45** L **7** # 313

Simms, William NVIDIA

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

wrong bits in title and body altogether

*SuggestedRemedy*

change bit 1.2318.8 to 1.2320.8, three instances

*Response* *Response Status* **W**

ACCEPT.

Cl **45** SC **45.2.1.250c.5** P **45** L **15** # 309

Simms, William NVIDIA

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

mismatch in title bit called out versus text

*SuggestedRemedy*

change bit 1.2318.7 to 1.2320.7, two instances

*Response* *Response Status* **W**

ACCEPT.

Cl **45** SC **45.2.1.250c.6** P **45** L **21** # 310

Simms, William NVIDIA

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

mismatch in title bit called out versus text

*SuggestedRemedy*

change bit 1.2318.5 to 1.2320.5, two instances

*Response* *Response Status* **W**

ACCEPT.

Cl **45** SC **45.2.1.250c.7** P **45** L **27** # 311

Simms, William NVIDIA

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

mismatch in title bit called out versus text

*SuggestedRemedy*

change bit 1.2318.4 to 1.2320.4, two instances

*Response* *Response Status* **W**

ACCEPT.

Cl **45** SC **45.2.3** P **45** L **38** # 188

Wienckowski, Natalie IVN Solutions LLC; Ethernovia & Bosch

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

Add note to registers to indicate they are also used for -V1 type PHYs.

*SuggestedRemedy*

Bring in Table 45-233.
Add the following, existing, registers in Table 45-233 (3.2318 through 3.2319, 3.2320 through 3.2321, 3.2322, 3.2323, 3.2324). Add a "a" superscript to the name.
Add note "a" at the end of the table: This register also applies to all MutltiG type -V1 PHYs.

*Response* *Response Status* **C**

ACCEPT.

Cl **45** SC **45.2.3.87.6** P **46** L **18** # 314

Simms, William NVIDIA

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

Hyphenation: “six bit counter” → IEEE style usually prefers “six-bit counter”

*SuggestedRemedy*

make six-bit counter

*Response* *Response Status* **C**

ACCEPT.

Cl **45** SC **45.5** P **46** L **26** # 448

Zimmerman, George CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

PICS are missing for clause 45, 46, 98, 191, 192 (annex 98B doesn't have PICS)

*SuggestedRemedy*

Add draft PICS for all clauses to IEEE 802.3dm from zimmerman_PICS_3dm_061326.pdf with editorial license, including license to add / change per comment resolution.

*Response* *Response Status* **C**

ACCEPT.

Cl **45** SC **table 45-212c** P **44** L **24** # 304

Simms, William NVIDIA

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

missing space in description column between 5 and Gb/s. Inconsistent with rest of table

*SuggestedRemedy*

add space between 5 Gb/s

*Response* *Response Status* **C**

ACCEPT.

Cl **45** SC **table 45-212c** P **44** L **28** # 305

Simms, William NVIDIA

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

missing space in description column between 2.5 and Gb/s. Inconsistent with rest of table

*SuggestedRemedy*

add space between 2.5 Gb/s

*Response* *Response Status* **C**

ACCEPT.

Cl **45** SC **Table 45-58f** P **37** L **9** # 296

Simms, William NVIDIA

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

Table 45–58f lists both MultiGBASE-AV1 and MultiGBASE-AT1 under bit 1.77.13, but the prose on pages 36–38 correctly puts AV1 at 1.77.13 and AT1 at 1.77.12.

*SuggestedRemedy*

change line 9 table entry for AT1 to Bit 1.77.12 and then maybe flip the order of the bits 13 and 12.

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

P37L9, Change "13" to "12".

Cl **46** SC **46.1** P **47** L **7** # 227

Torres, Luisma KD

*Comment Type* **TR** *Comment Status* **A** *Clause_46*

The inclusion of asymmetric PHYs in the Overview is not clear. The first suggested addition at line 10 refers to the concept "Asymmetric PHYs" and the second one at line 11 refers to the inclusion (and not limiting to) asymmetric PHYs with one of these rates in one direction and 100 Mb/s in the reverse direction". A more clear rewording is needed, specially for the undefined "reverse" direction (is the "reverse direction" relative (and inverse) to the "one direction" or an absolute direction equivalent to the "parallel decoding" direction?).I suggest to use the "transmit and receive paths" concepts specified in 46.1.6.

*SuggestedRemedy*

Reword the third paragraph of 46.1 as follows: "The RS adapts the bit serial protocol of the MAC to the parallel encodings of 2.5 Gb/s, 5 Gb/s, and 10 Gb/s symmetrical PHYs or to the parallel encodings of 2.5 Gb/s, 5 Gb/s, and 10 Gb/s asymmetrical PHYs in the transmit or receive path and 100 Mb/s in the other one.Though the XGMII is an optional interface, it is used extensively in this
standard as a basis for specification. The 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Physical Coding Sublayers (PCS), or the 100 Mb/s PCS in case of asymmetric PHYs, are specified to the XGMII, so if not implemented, a conforming implementation shall behave functionally as if the RS and XGMII were implemented."

*Response* *Response Status* **W**

ACCEPT.

*Cl* **46** *SC* **46.1** *P* **47** *L* **10** # 23

Ran, Adee Cisco Systems

*Comment Type* **T** *Comment Status* **A** *Clause_46*

"The 2.5 Gb/s, 5 Gb/s, and 10 Gb/s (including asymmetric PHYs with one of these rates in one direction and 100 Mb/s in the reverse direction) Physical Coding Sublayers (PCS) are specified to the XGMII"

This amended sentence does not make sense. The original sentence was about the various PCSs and the XGMII being their interface. The added parenthetical text talks about asymmetric PHYs, not PCSs.

The original sentence is still correct for many existing PCSs and should not be made more complicated by the addition of the new PCSs defined in this project.

The suggested remedy points to the specific PCSs using their clause numbers, which would be an improvement.

*SuggestedRemedy*

Change the quoted sentence to read
"The Physical Coding Sublayers (PCS) in Clause 127 (2.5BASE-X), Clause 179 (5GBASE-R), Clause 49 (10GBASE-R), Clause 191 (MultiG+100M/100M+MultiGBASE-T1/V1), and Clause 192 (MultiGBASE-A) are specified to the XGMII".

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by #227.

*Cl* **46** *SC* **46.1** *P* **47** *L* **16** # 24

Ran, Adee Cisco Systems

*Comment Type* **T** *Comment Status* **A** *Clause_46*

"It is capable of supporting at least one of the following rates of operation: 2.5 Gb/s, 5 Gb/s, or 10 Gb/s (including asymmetric PHYs with one of these rates in one direction and 100 Mb/s in the reverse direction)."

This sentence is in the "characteristics" list in the introduction subclause 46.1 and as such is essentially informative. The addition of the parenthesized text is not necessary. The original sentence is correct as it stands - the XGMII is indeed capable of supporting one of these rates - at least in one direction. The change does not create a normative requirement so it can be removed.

Similarly for 46.1.1 item i.

*SuggestedRemedy*

Delete the parenthesized text in item a and in item i of 46.1.1 (This would result in no change to these lists so the editing instructions can be removed).

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by #227.

*Cl* **46** *SC* **46.1** *P* **47** *L* **19** # 228

Torres, Luisma KD

*Comment Type* **ER** *Comment Status* **A** *Clause_46*

"Reverse direction" is not clear

*SuggestedRemedy*

Change "(including asymmetric PHYs with one of these rates in one direction and 100 Mb/s in the reverse direction)" to "(including asymmetric PHYs with one of these rates in the transmit or receive path and 100 Mb/s in the other path)."

*Response* *Response Status* **W**

ACCEPT.

*Cl* **46** *SC* **46.1.1** *P* **47** *L* **26** # 229

Torres, Luisma KD

*Comment Type* **ER** *Comment Status* **A** *Clause_46*

"Reverse direction" is not clear

*SuggestedRemedy*

Change "(including asymmetric PHYs with one of these rates in one direction and 100 Mb/s in the reverse direction)" to "(including asymmetric PHYs with one of these rates in the transmit or receive path and 100 Mb/s in the other one)."

*Response* *Response Status* **W**

ACCEPT.

*Cl* **46** *SC* **46.1.3** *P* **47** *L* **42** # 486

Dawe, Piers Nvidia

*Comment Type* **TR** *Comment Status* **A** *Clause_46*

"Symmetric operation at 10 Mb/s and 100 Mb/s is supported by the MII defined in Clause 22 and operation at 1000 Mb/s by the GMII defined in Clause 35": so what, this amendment is not about symmetric operation. Language.

*SuggestedRemedy*

Maybe something like this is meant: Asymmetric operation at 10 Mb/s and 100 Mb/s is defined for that direction by the MII of Clause 22 and similarly, operation at 1000 Mb/s is defined by the GMII of Clause 35." Add additional detail explaining how this works as necessary.

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Accommodated by #93 which removes this change.

*Cl* **46** *SC* **46.1.3** *P* **47** *L* **43** # 93

Kim, Yong General Motors

*Comment Type* **TR** *Comment Status* **A** *Clause_46*

"A compliant device may implement any subset of these rates in at least one direction" with "in at least one direction" inserted as new text. The new text allows for new capability of having XGMII operating at two separate high-speed, which is not intended nor correct.

*SuggestedRemedy*

Just delete the new text. I think it works.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Delete: in at least one direction

*Cl* **46** *SC* **46.1.3** *P* **47** *L* **43** # 230

Torres, Luisma KD

*Comment Type* **ER** *Comment Status* **A** *Clause_46*

"Direction" is not specifically defined, but derived from transmit and receive path.

*SuggestedRemedy*

Change "in at least one direction" to "in the transmit or received path"

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Accommodated by #93 which removes this change.

*Cl* **46** *SC* **46.1.3** *P* **47** *L* **45** # 487

Dawe, Piers Nvidia

*Comment Type* **T** *Comment Status* **A** *Clause_46*

The XGMII supports a MAC data rate of 100 Mb/s in one direction, for asymmetric operation, when at least one of the specified multigigabit rates is used in the other direction.

*SuggestedRemedy*

The XGMII operates at a MAC rate of 100 Mb/s in one direction, for asymmetric operation, when at least one of the specified multigigabit rates is used in the other direction.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by #102.

*Cl* **46** *SC* **46.1.3** *P* **47** *L* **45** # 94

Kim, Yong General Motors

*Comment Type* **ER** *Comment Status* **A** *Clause_46*

"The XGMII supports a MAC data rate of 100 Mb/s in one direction, for asymmetric operation, when at least one of the specified multigigabit rates is used in the other direction." This new text does not flow well with previous sentences.

*SuggestedRemedy*

How about
"Asymmetric operation at one of the specified multigigabit rates in one direction, XGMII supports a MAC data rate of 100 Mbps in the other direction.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by #102.

*Cl* **46** *SC* **46.1.3** *P* **47** *L* **45** # 102

Huber, Thomas — Nokia

*Comment Type* **E** *Comment Status* **A** *Clause_46*

As written, the text talks about symmetric operation at 10/100M, and asymmetric operation at 2.5/5/10G, but never mentions symmetric operation at 2.5/5/10G (this is of course implied). It would be more clear to explicitly state that symmetric operation at 2.5G, 5G, and 10G is supported by the XGMII.

*SuggestedRemedy*

Replace the last sentence of the paragrah with this:
The XGMII supports symmetric operation with a MAC data rate of 2.5 Gb/s, 5 Gb/s, or 10 Gb/s. The XGMII supports asymmetric operation with a MAC data rate of 100 MB/s in one direction and at least one of the specified muitigigabit rates in the other direction.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **46** *SC* **46.1.3** *P* **47** *L* **45** # 231

Torres, Luisma — KD

*Comment Type* **ER** *Comment Status* **A** *Clause_46*

"Direction" is not specifically defined, but derived from transmit and receive path. Asymmetry should appear before in the sentence.

*SuggestedRemedy*

Change "The XGMII supports a MAC data rate of 100 Mb/s in one direction, for asymmetric operation, when at least one of the specified multigigabit rates is used in the other direction." to "The XGMII supports for asymmetric operation a MAC data rate of 100 Mb/s in the transmit or receive path and 2.5 Gb/s, 5 Gb/s, or 10 Gb/s in the other path."

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Accommodated by #102.

*Cl* **46** *SC* **46.3.1.1** *P* **48** *L* **10** # 232

Torres, Luisma — KD

*Comment Type* **ER** *Comment Status* **A** *Clause_46*

Use the "transmit path" definition as specified in 46.1.6

*SuggestedRemedy*

Change "MAC's nominal transmit bit rate" to "MAC's nominal transmit path bit rate".

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Accommodated by #25.

*Cl* **46** *SC* **46.3.1.1** *P* **48** *L* **10** # 409

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

*Comment Type* **T** *Comment Status* **A** *Clause_46*

If a 7.5 Gbps high-speed rate is added, the text regarding the RS TX_CLK and RX_CLK need to be specified without specifying a new MAC rate, and the use of a 10 Gbps MAC parameterization should be identified.

*SuggestedRemedy*

Add the following new sentences (to shown in underline):
46.3.1.1 (at P48 L10, after the "transmit bit rate.") "When interfacing to a PHY with a 7.5 Gbps transmit bit rate, the TX_CLK frequency calculation shall use a 7.5 GHz in place of f_MAC, even though interfacing is to a MAC parameterized for 10 Gb/s as described in Table 4-2."
and, add to 46.3.2.1 (pat P48 L21, after "receive bit rate."
"When interfacing to a PHY with a 7.5 Gbps receive bit rate, the RX_CLK frequency calculation shall use a 7.5 GHz in place of f_MAC, even though interfacing is to a MAC parameterized for 10 Gb/s as described in Table 4-2."

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add the following new sentences (to shown in underline):
46.3.1.1 (at P48 L10, after the "transmit bit rate.") "When interfacing to a PHY with a 7.5 Gbps transmit bit rate, the TX_CLK frequency calculation shall use 7.5 GHz in place of f_MAC, even though interfacing is to a MAC parameterized for 10 Gb/s as described in Table 4-2."
and, add to 46.3.2.1 (pat P48 L21, after "receive bit rate."
"When interfacing to a PHY with a 7.5 Gbps receive bit rate, the RX_CLK frequency calculation shall use 7.5 GHz in place of f_MAC, even though interfacing is to a MAC parameterized for 10 Gb/s as described in Table 4-2."

*Cl* **46** *SC* **46.3.1.1** *P* **48** *L* **10** # 25

Ran, Adee — Cisco Systems

*Comment Type* **T** *Comment Status* **A** *Clause_46*

"corresponding to the MAC's nominal transmit bit rate"
The MAC does not have a nominal transmit bit rate, nor a nominal receiver bit rate.
The MAC is formaly defined as an bit-oriented entity that uses service interface primitives, without an associated data rate (there is no frequency parameter for the MAC); it is the choice of RS (and PHY below it) that governs the bit rate. (This is also an issue in the existing text - and it's a good time to fix it)

This project is modifying the specification of the RS such that it will have different bit rates in each direction (essentially creating new types of RS, asymmetric). The MAC is not modified and still does not have bit rates. So it's the RS bit rate in each direction that should be mentioned.

Similarly for RX_CLK in 46.3.2.1.

*SuggestedRemedy*

Change from
"f_MAC is the frequency (in Hz) corresponding to the MAC's nominal transmit bit rate"
to
"f_MAC is the frequency (in Hz) corresponding to the nominal MAC bit rate that the RS provides in the transmit direction (2.5 Gb/s, 5 Gb/s, 10 Gb/s, or 100 Mb/s)"

Make a similar change in 46.3.2.1 for the receive direction.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Make the requested change, including appropriate strikethrough and underline with appropriate editor's instruction.

*Cl* **46** *SC* **46.3.1.1** *P* **48** *L* **11** # 115

Kim, Yong — General Motors

*Comment Type* **ER** *Comment Status* **D** *Clause_46*

The addition of the word "transmit" does not add to clarity. It's already clear. TXCLK is by definitoin transmit direction. There is, however, technical concern on how asymetric MAC rates are defined. It's missiing (see my comment on CL4.4.2 reference).

*SuggestedRemedy*

Delete the added word "transmit"

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Accommodated by #25.

*Cl* **46** *SC* **46.3.1.1** *P* **48** *L* **21** # 233

Torres, Luisma — KD

*Comment Type* **ER** *Comment Status* **A** *Clause_46*

Use the "transmit path" definition as specified in 46.1.6

*SuggestedRemedy*

Change "MAC's nominal receive bit rate" to "MAC's nominal receive path bit rate".

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Accommodated by #25.

*Cl* **46** *SC* **46.3.2.1** *P* **48** *L* **16** # 315

Simms, William — NVIDIA

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

Reference to 46.3.1.1 should be 46.3.2.1

*SuggestedRemedy*

change to 46.3.2.1

*Response* *Response Status* **W**

ACCEPT.

*Cl* **46** *SC* **46.3.2.1** *P* **48** *L* **18** # 234

Torres, Luisma — KD

*Comment Type* **ER** *Comment Status* **A** *Clause_46*

The suggested deletion implies losing the option to do not use the nominal clock

*SuggestedRemedy*

Revert the deletion to preserve flexibility

*Response* *Response Status* **W**

ACCEPT.

*Cl* **46** *SC* **46.3.2.1** *P* **48** *L* **18** # 116

Kim, Yong — General Motors

*Comment Type* **TR** *Comment Status* **A** *Clause_46*

"it may be that of a nominal clock" of which "it may be that of a" is deleted as a change. I recall the original text to be permissible behavior, whereas with this deletion, it is not -- for other PHYs that use XGMII.

*SuggestedRemedy*

Unless the work was done to ensure all implementations prior to this project is not affected by this change, revert back this change. If the intended change is just for 802.3dm PHYs, text should be revised just for the CL191/2 PHY types.

*Response* *Response Status* **C**

ACCEPT.

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*Cl* **46** *SC* **46.3.2.1** *P* **48** *L* **18** # 401

Nicholl, Shawn — AMD

*Comment Type* **T** *Comment Status* **A** *Clause_46*

The revised text "the nominal clock (e.g., TX_CLK)" is more restrictive than the existing 802.3-2022 text. The revised text suggests (i.e. implies) that there is only one nominal clock. The existing 802.3-2022 text "a nominal clock (e.g., TX_CLK)" permits RX_CLK to use a nominal clock frequency that differs from the nominal frequency of TX_CLK.

*SuggestedRemedy*

Propose returning to the text ("a nominal clock") that exists in 802.3-2022. In other words, restore this text: "... received data or it may be that of a nominal clock (e.g., TX_CLK)."

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **46** *SC* **46.6.3.1** *P* **49** *L* **7** # 26

Ran, Adee — Cisco Systems

*Comment Type* **T** *Comment Status* **A** *Clause_46*

The optional items in the PICS are intended to identify the feature set of a product. In the original PICS it was clear what G1, G2, and G3 mean. The proposed changes make it ambiguous: PHYs that use 100M in the Tx directiion and PHYs that use 100M in the Rx directtion will have the same set of PICs responses.
There is a better way to define the features.

*SuggestedRemedy*

Replace the new item G3a with three separate items:
G3a - PHY uses 100 Mb/s in the transmit direction
G3b - PHY uses 100 Mb/s in the receive direction
G3c - PHY does not use 100 Mb/s in either direction
Ther 3 should have status "PHY:O/1" so that one and only one of them has to be supported.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Make the requested change with editorial license to update if the referenced text changes.

---

*Cl* **98** *SC* **98** *P* **50** *L* **4** # 488

Dawe, Piers — Nvidia

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

There is 73, Auto-Negotiation for backplane and copper cable assembly, which includes single-lane media. 73 precedes 98, so 98 cannot broaden its scope to "Auto-Negotiation for single-lane media"

*SuggestedRemedy*

If the distinction is that 98 is bidirectional and 73 is not, use that to choose a suitable title.

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Accommodated by #1.

*Cl* **98** *SC* **98.1.1** *P* **50** *L* **15** # 1

Ran, Adee Cisco Systems

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

The original text included the words "single twisted pair", but it is amended to "single-lane media". This is an inappropriate name since there is another auto-negotiation function in clause 73 that also works on single-lane media, and there are other single-lane media (such as optical fibers) that do not use any form of auto-negotiation.

Clause 98 was indeed written specifically for single twisted pair applications. The new name is too broad and will cause confusion for readers who are not familiar with all of the 802.3 PHYs.

This change is pervasive in clause 98.

*SuggestedRemedy*

If the scope of this clause is to be extended to other media such as shielded balanced cables or unbalanced coaxial cables, the name can be changed to include these specific media. Alternatively, change the text such that it refers to the specific PHY types that use this clause, regardless of the media type.

In the remainder of the clause, change "Single twisted pair Auto-negotiation" to "Auto-negotiation defined in this clause" or just delete it if approriate. Do not use "single-lane".

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change the title of Clause 98 to: Auto-Negotiation for single differential-pair or single-ended (unbalanced) media

P50L15
Change the first sentence of Clause 98:
Change: Clause 98 describes the single twisted-pair Auto-Negotiation function that allows a device to advertise….
To: Clause 98 describes the --single twisted-pair-- Auto-Negotiation function --that allows-- _used on single differential-pair media or single-ended unbalanced media to allow_ a device to advertise…

Throughout Clause 98 change: “Single-lane Auto-Negotiation” or “Auto-Negotiation for single-lane media”
To: Clause 98

Note 3 on Figure 98-2
Change: Medium is either a single-lane of differential balanced pair or unbalanced single-ended

To: Medium is either a single differential-pair or single-ended unbalanced

Change the title of Table 98-7 to: State diagram variable to _Clause 98_ --Single twisted-pair-- Auto-Negotiation MDIO register mapping

Change 98.6 PICs to new Clause 98 title

98.5.1 PICS introduction needs to be updated to new clause title

98.6.2.2 PICS Protocol summary needs to be adjusted (P54 L20) to the new clause title.

98.6.3 Change the feature of *UNB to be "(Unbalanced) single-ended media"

98.6.4 PICS item G1 Feature changes to simply “Auto-Negotiation function”

--xxx-- means "xxx" is shown in strikethrough
_xxx_ means "xxx" is shown in underline.

*Cl* **98** *SC* **98.2.1.1.4** *P* **52** *L* **47** # 316

Simms, William NVIDIA

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

missing Ohm symbol

*SuggestedRemedy*

replace 100 / with 100 Ohm

*Response* *Response Status* **W**

ACCEPT.

*Cl* **98** *SC* **98.2.1.1.4** *P* **52** *L* **48** # 317

Simms, William NVIDIA

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

typo 'within range'

*SuggestedRemedy*

replace 'within range' with 'within the range'

*Response* *Response Status* **W**

ACCEPT.

*Cl* **98** *SC* **98.2.1.2.4** *P* **53** *L* **8** # 318

Simms, William NVIDIA

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

Body is clearly Technology Ability Field (A[26:0])… — belongs in 98.2.1.2.4, not 98.2.1.1.4 (transmitter peak output).

*SuggestedRemedy*

change to 98.2.1.2.4

*Response* *Response Status* **W**

ACCEPT.

*Cl* **98** *SC* **98.2.4.2** *P* **53** *L* **0** # 209

Slavick, Jeff Broadcom

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

The base standard definition for Priority Resolution in Clause 98 appears to need some updating as well. I believe the resolution for Asymmertric is for not a single matching bit, but a pair of corresponding abilities where for example one side is 10G/100M (A16) and the other is 100M/10G (A15). If you hooked two devices that only advertised 10G/100M to each other they should fail to select a 10G/100M operation (which is a matching set of ability bits with both set A16).

*SuggestedRemedy*

In 98.2.4.2 change:
"The single PHY enabled to connect to the MDI by Auto-Negotiation shall be the technology corresponding to the bit in the Technology Ability Field common to the local device and link partner that has the highest priority as defined in 98B.4 (listed from highest priority to lowest priority)."
To:
"The PHY enabled to connect to the MDI by Auto-Negotiation shall be the technology corresponding to the bit in the Technology Ability Field that has the highest priority as defined in 98B.4."

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by #41.

*Cl* **98** *SC* **98.5.1** *P* **53** *L* **46** # 41

Muma, Scott Microchip

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

This section contains a Note that redefines how priority resolution HCD is to work. This should be updated in 98.2.4.2 instead since that is where priority resolution is defined.

*SuggestedRemedy*

Replace the text in 98.2.4.2 with changes shown in muma_d2d0_asymmetric_98_4_2_4.pdf

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Bring in 98.2.4.2 and make the changes shown in muma_d2d0_asymmetric_98_4_2_4.pdf with editorial license to make updates based on the new Table 98B-2 per comment #211.

*Cl* **98** *SC* **98.6.2.2** *P* **54** *L* **21** # 103

Huber, Thomas Nokia

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

In the right-hand column of the table, Single Differential-Pair should be removed

*SuggestedRemedy*

Change Single Differential Pair to strike-through font

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Make the appropriate change indications, strikethrough and underline, based on the final name.

*Cl* **98B** *SC* **98B** *P* **250** *L* **0** # 324

Simms, William NVIDIA

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

The header is different than rest of document

*SuggestedRemedy*

*Response* *Response Status* **C**

ACCEPT.

*Cl* **98B** *SC* **98B** *P* **251** *L* **0** # 325

Simms, William NVIDIA

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

The header is different than rest of document

*SuggestedRemedy*

*Response* *Response Status* **C**

ACCEPT.

*Cl* **98B** *SC* **98B.3** *P* **250** *L* **14** # 18

Ran, Adee Cisco Systems

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

There is an editorial instruction to change rows in the table, and then to replace the table.

*SuggestedRemedy*

Delete the instruction "Replace Table 98B-1 as follows".

*Response* *Response Status* **C**

ACCEPT.

*Cl* **98B** *SC* **98B.3** *P* **250** *L* **17** # 110

Huber, Thomas Nokia

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

The table being modified is Table 98B-1 rather than 1b

*SuggestedRemedy*

in the title of the table, change Table 98B-1b to Table 98B-1

*Response* *Response Status* **C**

ACCEPT.

*Cl* **98B** *SC* **98B.4** *P* **250** *L* **43** # 19

Ran, Adee Cisco Systems

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

"Table 98B–2 shall indicate the relative priorities" - The table is a definition, not a normative requirement. The requirement it is to implement the resolution according to the table. But this is already stated in 98.2.4.2 and should not be repeated here.

*SuggestedRemedy*

Change to "Table 98B–2 indicates the relative priorities".

*Response* *Response Status* **C**

ACCEPT.

*Cl* **98B** *SC* **98B.4** *P* **251** *L* **38** # 210

Slavick, Jeff — Broadcom

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

Table 93B-2 doesn't appear to be sustainable. I think you can retain it as a dashed list.

*SuggestedRemedy*

Replace 98B.4 with the following:
Since a local device and a link partner may have multiple abilities in common, a prioritization scheme exists to ensure that the highest common denominator ability is chosen. For PHYs with asymmetric transmit and receive rates the proper combination of abilities is required to negotiate to that operating mode. The following list shall represent the relative priorities of the technologies supported by the IEEE 802.3 Selector Field value, where priorities are listed from highest to lowest and “(L)” stands for “Leader” and “(F)” for “Follower”:

— 25GBASE-T1
— 10GBASE-T1
— 100M+10GBASE-T1/V1 (L) with 10G+100MBASE-T1/V1 (F)
— 10G+100MBASE-T1/V1 (L) with 100M+10GBASE-T1/V1 (F)
— 5GBASE-T1
— 100M+5GBASE-T1/V1 (L) with 5G+100MBASE-T1/V1 (F)
— 5G+100MBASE-T1/V1 (L) with 100M+5GBASE-T1/V1 (F)
— 2.5GBASE-T1
— 100M+2.5GBASE-T1/V1 (L) with 2.5G+100MBASE-T1/V1 (F)
— 2.5G+100MBASE-T1/V1 (L) with 100M+2.5GBASE-T1/V1 (F)
— 1000BASE-T1
— 100BASE-T1L increased tx/rx
— 100BASE-T1L standard tx/rx
— 100BASE-T1
— 10BASE-T1S full duplex
— 10BASE-T1S half duplex
— 10BASE-T1L

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accomodated by 211.

*Cl* **98B** *SC* **98B.4** *P* **251** *L* **38** # 211

Slavick, Jeff — Broadcom

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

Table 93B-2 doesn't appear to be sustainable. Make the table be 3 columns which lists the Leader & Follower ability bits and what the Technology that maps to, using the order in the table as the priority.

*SuggestedRemedy*

Update 98B.4 to be as follows:
Since a local device and a link partner may have multiple abilities in common, a prioritization scheme exists to ensure that the highest common denominator ability is chosen. When the Leader PHY and Follower PHY both indicate the Technology Ability present in a given row of Table 98B-2, that is considered a common ability. Table 98B-2 specifies the relative priorities of the technologies supported by the IEEE 802.3 Selector Field value, the priorities are listed from highest to lowest.

Table 98B-2

| Leader | Follower | Technology |
|---|---|---|
| A6 | A6 | 25GBASE-T1, highest priority |
| A5 | A5 | 10GBASE-T1 |
| A15 | A16 | 100M+10GBASE-T1/V1 (L), 10G+100MBASE-T1/V1 (F) |
| A16 | A15 | 10G+100MBASE-T1/V1 (L), 100M+10GBASE-T1/V1 (F) |
| A4 | A4 | 5GBASE-T1 |
| A13 | A14 | 100M+5GBASE-T1/V1 (L), 5G+100MBASE-T1/V1 (F) |
| A14 | A13 | 5G+100MBASE-T1/V1 (L), 100M+5GBASE-T1/V1 (F) |
| A3 | A3 | 2.5GBASE-T1 |
| A13 | A14 | 100M+2.5GBASE-T1/V1 (L), 2.5G+100MBASE-T1/V1 (F) |
| A14 | A13 | 2.5G+100MBASE-T1/V1 (L), 100M+2.5GBASE-T1/V1 (F) |
| A2 | A2 | 1000BASE-T1 |
| A21 | A21 | 100BASE-T1L increased tx/rx |
| A10 | A10 | 100BASE-T1L standard tx/rx |
| A0 | A0 | 100BASE-T1 |
| A1 | A1 | 10BASE-T1S full duplex |
| A22 | A22 | 10BASE-T1S half duplex |
| A9 | A9 | 10BASE-T1L, lowest priority |

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement table https://www.ieee802.org/3/dm/public/0726/98B_Table_2_proposal.pdf.

Add note: NOTE—(L) stands for Leader and (F) stands for Follower

*Cl* **98B** *SC* **98B.4** *P* **251** *L* **41** # 218

Slavick, Jeff — Broadcom

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

The NOTE indicates that "F" and "L" are be intrepretted as Follower and Leader but the table uses them as "(F)" and "(L)". There are other L present in the definitions like T1L.

*SuggestedRemedy*

Change "L" to "(L)" and "F" to "(F)" in the NOTE.

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **191** *SC* **191** *P* **56** *L* # 118

Kim, Yong — General Motors

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

Asymmetric PHYs operate with XGMII down to 100 Mbps MAC rate (for the low-speed path). There is no referece to 100 Mbps MAC rates (explicit or implcit reference to CL 4.4.2 MAC paameters).

*SuggestedRemedy*

If TF addressed this concern but not obvious to the reviewer, please help identify where it is addressed. And if it is addressed, whether CL4 or Annex 4A MAC is referenced.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add the following as a new paragraph in 191.1 after the paragraph added by #143.

This clause defines multiple PHY types named according to <maximum transmit data rate>+<maximum receive data rate>BASE-T1/V1, where -T1 is for single differential balanced-pair media, and -V1 is for single-ended unbalanced media. Clause 191 PHYs are defined to use the Clause 46 Add: XGMII in a configuration where the RS supports an asymmetric data rate with the multigigabit transmit (or receive) rate on the TX (or RX) path, and the 100 Mb/s receive (or transmit) rate on the RX or TX path of the XGMII. The Clause 4 MAC parameters for the appropriate rate (multigigabit or 100 Mb/s) are used in conjunction with the PHYs described in this clause in conjunction with either the multigigabit (HS) path or the 100 Mb/s (LS) path.

---

*Cl* **191** *SC* **191** *P* **56** *L* **4** # 452

RAJAGOPAL, KARTHIK — TEXAS INSTRUMENTS INC

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

The draft as looked at an IEEE standard to facilitate interoperability fails to offer a clear implementation guide with more than 1 type of implementation/standard to choose from. Sections 191 and 192 with their widely different PCS & PMA layers fails to fulfil the primary goal which is to be a standard. This would not qualify as standard if users are free to choose from multiple implementations which tries to achieve the same function.

*SuggestedRemedy*

Rather than letting users guess or arbitrarily choose 1 of the 2 types of PCS & PMA implementation, a technically superior implementation needs to be selected and made as a standard with clear guideline on the PCS and PMA layers. This way facilitates maximum interoperability, which is the only path for this draft to be considered as an IEEE standard

*Response* *Response Status* **C**

REJECT.

The CRG disagrees with the commenter.

The PHYs in Clause 191 and Clause 192 present different feature sets which meet the distinct identities which meet different objectives approved by the WG. See https://ieee802.org/3/dm/public/0326/Objectives_ISAAC_01_0326.pdf.

Users may select which PHY to use based on which features they value.

*Cl* **191** *SC* **191** *P* **56** *L* **4** # 2

Ran, Adee — Cisco Systems

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

The title of clause 191 includes the list of PHYs covered, which is long. The same list repeats in the text of the clause as well as in other places in this draft. This is very disruptive to readers and does not add much value.

Since these PHYs have some common features and are distinct from others, it is adequate to give them a common nomenclature as a family of PHYs, following the example of MultiGBASE-A in this project, and other precedence, such as "BASE-R" and "BASE-T1" in the existing definitions.

I suspect that the new definition of 100M+MultiGBASE (1.4.46g) is suitable for some of these PHYs and MultiG+100MBASE (1.4.249a) covers the rest. The term "MultiG+100M/100M+MultiGBASE-T1/V1" is mentioned in 191.1.1 as covering both, but has no definition in 1.4.

*SuggestedRemedy*

Use the family names 100M+MultiGBASE and MultiG+100MBASE to refer to all the PHYs in the respective family instead of listing all PHYs.

Add a definition of MultiG+100M/100M+MultiGBASE-T1/V1 in 1.4. and use this family name in the title of clause 191 and to replace the long lists in clause 191 and elsewhere in the document (e.g. in 46.1.2).

Use the family names in 191.1 and refer to the definitions in 191.1.1.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

See #281 for updated name and text in 191.1.

Add definition for MultiG+100M/100M+MultiGBASE between definitions as 1.4.249b, and increment new definitions added after this.

1.4.249b MultiG+100MBASE/100M+MultiGBASE: PHYs that belong to the set of specific asymmetric PHYs that transmit or recieve at speeds in excess of 1000 Mb/s and receive or transmit at 100 Mb/s, with concurrent transmission in both directions, including 2.5G+100MBASE-T1, 2.5G+100MBASE-V1, 5G+100MBASE-T1, 5G+100MBASE-V1, 10G+100MBASE-T1, 10G+100MBASE-V1, 100M+2.5GBASE-T1, 100M+2.5GBASE-V1, 100M+5GBASE-T1, 100M+5GBASE-V1, 100M+10GBASE-T1, and 100M+10GBASE-V1. (See IEEE Std 802.3, Clause 191.)

*Cl* **191** *SC* **191** *P* **56** *L* **5** # 281

Jones, Peter — Cisco Systems

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

The repeated usage of “100M+2.5GBASE-T1, 2.5G+100MBASE-T1, 100M+5GBASE-T1, 5G+100MBASE-T1, 100M+10GBASE-T1, 10G+100MBASE-T1, 100M+2.5GBASE-V1, 2.5G+100MBASE-V1, 100M+5GBASE-V1, 5G+100MBASE-V1, 100M+10GBASE-V1, 10G+100MBASE-V” makes this hard to read.

Moving the definitions of MultiG+100M/100M+MultiGBASE-T1, MultiG+100M/100M+MultiGBASE-V1 and MultiG+100M/100M+MultiGBASE-T1/V1 to the front of the introduction and using them in the clause heading and in the rest of “191.1 Overview”, as well as in PICs sub-clauses will significantly improve readability

*SuggestedRemedy*

Please see changes in P8023dm_D2p0_pjones_introduction.docx attached to ballot submission.
Make the equivalent changes in:
- 191.15 title
- 191.15.1 first paragraph
- 191.15.2.2 - Identification of protocol standard text
- 191.15.4 title

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Make changes as defined in P8023dm_D2p0_pjones_introduction_TF.pdf with editorial license to make other updates, as appropriate.

*Cl* **191** *SC* **191.1** *P* **56** *L* **15** # 117

Kim, Yong — General Motors

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

The list of PHY types is really long, and reader must follow carefully to understand slight differences. Normally we do not use PHY types in a table in the overview section. But this overview could use a table to help readers to make sense quickly.

*SuggestedRemedy*

Was going to suggest adding a table, by speed (HS and LS) and media type, but then found the Table 191-2. Consider moving and referencing Table 191-2 to the overview section and remove a long list of PHY types in the text. It may be clearer to split the Table 191-2 into two tables, one for balanced and one for single ended (easier to referecne from the overview clause).

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by #281 which updates the text in 191.1.

*Cl* **191** *SC* **191.1** *P* **56** *L* **31** # 3

Ran, Adee Cisco Systems

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

"The conductors supporting the operation of the 100M+2.5GBASE-T1, <…> are defined <…> allowing implementers to provide their own conductors <…> as long as the normative requirements included in 191.9 are met"

191.9 discusses link segments that are not just conductors but specifically "shielded balanced pair of conductors". The term "link segment" is also used in 191.1.

Simlarly in the next paragraph which discusses -V1 PHYs.

Also possibly in clause 192.

*SuggestedRemedy*

In the quoted senteence, change "conductors" to "link segments".

Make the same change in the paragraph about -V1.

Implement in clause 192 if appropriate.

*Response* *Response Status* **C**

ACCEPT.

This comment does not apply to Clause 192.

*Cl* **191** *SC* **191.1** *P* **56** *L* **34** # 282

Jones, Peter Cisco Systems

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

The text “implementers to provide their own conductors” sounds wrong. Implementers always provide conductors; the standard does not.

*SuggestedRemedy*

Change “implementers to provide their own conductors” to “implementers to specify their own conductors”.
Make the same change on page/line: 56/44.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by #3.

*Cl* **191** *SC* **191.1** *P* **56** *L* **48** # 4

Ran, Adee Cisco Systems

*Comment Type* **T** *Comment Status* **A** *191_overview*

I assume that the PHY types defined in this clause interoperate only asymmetrically, e.g. 100M+2.5GBASE-T1 and 2.5G+100MBASE-T1 can be used to form a link, but not two PHYs of the same type.

This is a non-trivial property of these PHYs and should be mentioned in the overview. In fact I do not see it mentioned anywhere, except implicitly in 98B.4, which is unclear and not referenced from clause 191; and auto-negotiation is defined as optional.

Also possibly in clause 192.

*SuggestedRemedy*

Add text in 191.1 and possibly elsewhere to describe the possible configurations of links using these PHYs.

Implement in clause 192 if appropriate.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

See #143 for updates in 191.

Clause 192 already has this type of description.

*Cl* **191** *SC* **191.1** *P* **56** *L* **49** # 143

Wienckowski, Natalie IVN Solutions LLC; Ethernovia & Bosch

*Comment Type* **E** *Comment Status* **A** *191_overview*

add new paragraph to define the type of transmission.

*SuggestedRemedy*

These PHYs continuously transmit in both directions concurrently, but at different baud rates. Unlike frequency division techniques, the PHYs have full spectral overlap in the two transmit directions, but utilize the relatively narrow bandwidth of the Low Data Rate (LDR) signal to enable separation without echo cancellation.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

These PHYs continuously transmit in both directions concurrently, but at different baud rates. Unlike frequency division techniques, the PHYs have full spectral overlap in the two transmit directions, but utilize the relatively narrow bandwidth of the Low Data Rate (LDR) signal to enable separation of the remote signal from the echo signal.

*Cl* **191** *SC* **191.1.1** *P* **57** *L* **42** # 5

Ran, Adee Cisco Systems

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

The nomenclature subclause is supposed to explain to the reader what the terms mean. The text here looks like instructions to the editors or contributors.

Also possibly in clause 192.

*SuggestedRemedy*

Change from
"For all PHYs communicating on a shielded, balanced, pair of conductors, regardless of transmit bit rate, use: MultiG+100M/100M+MultiGBASE-T1"
to
"The term MultiG+100M/100M+MultiGBASE-T1 is used to refer to the PHYs in this clause that communicate on a shielded, balanced, pair of conductors, regardless of transmit bit rate".

Make similar changes to the text describing the other terms.

Implement in clause 192 if appropriate.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

This text is deleted based on comment #281.

See comment #109 for updates to Clause 192.

*Cl* **191** *SC* **191.1.1** *P* **57** *L* **43** # 104

Huber, Thomas Nokia

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

The wording for the aggregate terminology below the figure is a bit awkward: "For all PHYs communicating on a shielded, balanced, pair of conductors, regardless of transmit bit rate, use:", etc.

*SuggestedRemedy*

Delete the definitions below the figure. Add these to the list of nomenclature that is above the figure:
MultiG+100M/100M+MultiGBASE-T1 Refers to all PHYs communicating on a shielded, balanced, pair of conductors, regardless of bit rate
MultiG+100M/100M+MultiGBASE-V1 Refers to all PHYs communicating on a coaxial cable, regardless of bit rate
MultiG+100M/100M+MultiGBASE-T1/V1 Refers to all PHYs regardless of cable type or bit rate

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

See #281 which rewrites this text.

*Cl* **191** *SC* **191.1.1** *P* **58** *L* **1** # 105

Huber, Thomas Nokia

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

"PHY's transmit bit rate" is unnecessarily personifying the PHY

*SuggestedRemedy*

Change to "transmit bit rate of the PHY"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.1.2** *P* **59** *L* **14** # 77

Ran, Adee Cisco Systems

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

Both stacks in figure 191-2 include a "PMD" box. But these PHYs do not have a PMD sublayer (based on the clause title and lack of a PMD subclause). The -T1 and -V1 are PHYs for different media, and the differences are in the MDI (191.5.2.10 and 191.5.2.11).

There are other mentions of "PMD" in 191.1.3.3 and 191.11.2.1, and in the PICS.

*SuggestedRemedy*

Delete the PMD boxes and legend item from the figure.
Delete other mentions of PMD from the clause.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Do the suggested remedy and

P63L50 change PMD to MDI

P150L39 change PMD to PHY

P152L1 change PMD to PHY

*Cl* **191** *SC* **191.1.2** *P* **59** *L* **15** # 78

Ran, Adee Cisco Systems

*Comment Type* **T** *Comment Status* **A** *EZ - pull*

The right side of Figure 191-2 shows the -V1 stack with an AN block, referred to as optional, and the text above the figure points to clause 98 for the whole family (including -V1). Also in 191.1.3 AN is mentioned for both T1 and V1, and there are numerous other mentions of AN in the clause.

However, in 191.8.1 it is stated that -V1 PHYs do not support AN.

*SuggestedRemedy*

Delete the AN block from the right-hand stack and delete the -V1 family from references to AN.
Conside how to clarify that AN is not supported (even as an option) in -V1, in the other mentions of AN.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

See #158 which deletes the erroneous statement that Clause 98 is not supported by MultiG+100MBASE-V1.

*Cl* **191** *SC* **191.1.3** *P* **59** *L* **33** # 145

Wienckowski, Natalie IVN Solutions LLC; Ethernovia & Bosch

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

improve wording

*SuggestedRemedy*

Change: receives at a 100 Mb/s bit rate
To: receives at a bit rate of 100 Mb/s
Also P59L35.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.1.3** *P* **61** *L* **24** # 454

Law, David HPE

*Comment Type* **E** *Comment Status* **D** *191_state_diag*

Subclause 191.5.2.8.1 'State diagram variables' says sync_link_control is a variable that indicates the data source for the PMA Transmit function. Further, subclause 191.5.2.2 'PMA Transmit function' says, 'During Link Synchronization, when sync_link_control = DISABLE and Auto-Negotiation is either not enabled or is not implemented, the sync_tx_symb output by the PHY Link Synchronization function shall be used in place of tx_symb as the data source for PMA Transmit.'.

Based on this, the output of the PMA TRANSMIT block is controlled by sync_link_control, yet Figures 191–3 'PHY_S functional block diagram', 191–4 'PHY_D functional block diagram', and 191–25 'PMA reference diagram' do not show sync_link_control connected to the PMA TRANSMIT block.

*SuggestedRemedy*

Add sync_link_control as a connection to the PMA TRANSMIT block in Figures 191–3, 191–4 and 191–25.

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT.

*Cl* **191** *SC* **191.1.3.2** *P* **63** *L* **25** # 521

Jonsson, Ragnar Infineon

*Comment Type* **T** *Comment Status* **D** *late-2*

The RS-FEC used for both ACT LS and TDD have low correction capability, increasing the probability of uncorrectable error occurance. For ACT LS we can more reliably detect uncorrectable errors by replacing the "six vendor-specific bits" with a CRC-6 checksum to help detect uncorrectable FEC frames.

*SuggestedRemedy*

Update the text to replace the "six vendor-specific bits" with a CRC-6 checksum to help detect uncorrectable FEC frames. These changes will propagate through several places in the document and this change will be described in more detail in an accompanying presentation.

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Implement the changes shown on slides 3 through 7 of https://www.ieee802.org/3/dm/public/0726/jonsson_3dm_01_0726.pdf.

*Cl* **191** *SC* **191.1.3.2** *P* **63** *L* **28** # 501

Razavi, Alireza Eliyan

*Comment Type* **E** *Comment Status* **A** *late - EZ*

While PHY_D and PHY_S defined, 100M+MultiGBASE-T1/V1 , and MultiGBASE+100M-T1/V1 are widely used

*SuggestedRemedy*

use PHY_D for 100M+MultiGBASE-T1/V1,and PHY_S as MultiGBASE+100M-T1/V1 in the text

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change: 100M+MultiGBASE-T1/V1
To: PHY_D

AND

Change: MultiGBASE+100M-T1/V1
To: PHY_S

Throughout Clause 191.

*Cl* **191** *SC* **191.1.4** *P* **64** *L* **26** # 517

Razavi, Alireza Eliyan

*Comment Type* **E** *Comment Status* **A** *late - EZ*

Passive voice: “HS_PATH signaling is performed by the HS_TX PCS generating continuous code-group sequences …”

*SuggestedRemedy*

replace with "HS_TX PCS generates countinous..", same for p64,l52, p76,l27,

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.2.1** *P* **146** *L* **43** # 160

Wienckowski, Natalie IVN Solutions LLC; Ethernovia & Bosch

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

The frequency range for PSANEXT should be modified to match the rest of this subclause.

*SuggestedRemedy*

At the end of the sentence add the following:
where f is the frquency in MHz; 3 <=f <= 4000

*Response* *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **191** *SC* **191.2.2** *P* **146** *L* **47** # 161

Wienckowski, Natalie IVN Solutions LLC; Ethernovia & Bosch

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

The frequency range for PSAACRF should be modified to match the rest of this subclause.

*SuggestedRemedy*

At the end of the sentence add the following:
where f is the frquency in MHz; 3 <=f <= 4000

*Response* *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **191** *SC* **191.2.2.1.1** *P* **70** *L* **8** # 380

Maguire, Valerie — Copperopolis; aff'l w/ CME Consulting, Microchip, and

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

It's unclear what " in case" means here… Do we mean "if transmission of…"? Or, "when transmission of…"?

*SuggestedRemedy*

Replace "...in case transmission of…" with "…when transmission of…" in the following six locations:
P70, L8
P70, L10
P119, L15
P125, L11
P167, L11
P167, L14

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **191** *SC* **191.2.2.2** *P* **70** *L* **25** # 79

Ran, Adee — Cisco Systems

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

"Clause 98" is formatted as external reference but exists in the draft.

*SuggestedRemedy*

Make it an active xref.

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **191** *SC* **191.2.2.4.2** *P* **72** *L* **5** # 320

Simms, William — NVIDIA

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

should we be using MHz or MBd?

*SuggestedRemedy*

change to MBd if desired

*Response* *Response Status* **C**

REJECT.

MHz is correct.

This is MHz in Clause 149 and GHz in Clause 165.

---

*Cl* **191** *SC* **191.2.2.5.3** *P* **72** *L* **37** # 319

Simms, William — NVIDIA

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

should LS_RX point to 191.5.2.5?

*SuggestedRemedy*

change LS_RX point to 191.5.2.3

*Response* *Response Status* **W**

ACCEPT.

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*Cl* **191** *SC* **191.2.2.9.1** *P* **74** *L* **4** # 321

Simms, William — NVIDIA

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

Other sections titled 'Semantics of the primitive' go on to name features or further define things. This one seems to be missing. Is it intentional?

*SuggestedRemedy*

add definitions of primirive if desired

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by #455.

---

*Cl* **191** *SC* **191.2.2.9.1** *P* **74** *L* **4** # 455

Law, David — HPE

*Comment Type* **T** *Comment Status* **A** *EZ - pull*

The semantics of the PMA_PCSDATAMODE.indication primitive are missing a definition of the pcs_data_mode parameter.

*SuggestedRemedy*

Add the text:

The pcs_data_mode parameter can take on one of two values of the form:
TRUE The PCS is transmitting and receiving data from the XGMII.
FALSE The PCS is in a training or test mode.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

The pcs_data_mode parameter can take on one of two values of the form:
TRUE The PHY Control is in the state PCS_DATA.
FALSE The PHY Control is not in the state PCS_DATA.

*Cl* **191** *SC* **191.3.2** *P* **74** *L* **26** # 146

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

improve wording and add OAM

*SuggestedRemedy*

Change: The PCS comprises one PCS Reset function and two simultaneous and asynchronous operating functions, one of which is the HS_PATH and the other is the LS_PATH. This subclause discusses the HS_PATH. The
HS_PATH PCS operating functions are the HS_TX PCS Transmit in the PHY_S device, and the HS_RX PCS Receive in the PHY_D device.
To: The HS_PATH PCS comprises the following functions: PCS Reset, HS_TX PCS Transmit in the PHY_S device, HS_RX PCS Receive in the PHY_D device, and an optional PCS OAM. The PCS Transmit and PCS Receive functions execute simultaneously and asynchronously.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.3.2.1** *P* **76** *L* **5** # 422

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

There is only one PCS reset - there isn't a 'low speed reset' and a 'high speed reset'. The text should reflect this.

*SuggestedRemedy*

Insert the following after "PCS Reset initializes all PCS functions." (P76 L4) "This means that there is only one PCS Reset, resetting both the low speed and high speed paths."

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.3.2.2** *P* **76** *L* **20** # 402

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

*Comment Type* **T** *Comment Status* **A** *191_PCS*

The 65B/65B state diagram is not Figure 191-9 or 191-10 - those are the block diagrams and are not required. Figure 191-18 is the 64B/65B state diagram and should be required at this point in the text.

*SuggestedRemedy*

Change the first paragraph of 191.3.2.2 to read:

The PCS Transmit function shall conform to the PCS 64B/65B Transmit state diagram in Figure 191–18.
The PCS Transmit bit ordering shall conform to Figure 191–11 for a 10G+100MBASE-T1/V1 PHY. For a 5G+100MBASE-T1/V1 or a 2.5GBASE-T1/V1 PHY, the PCS Transmit bit ordering shall conform to Figure 191-12.
Adjust PICS appropriately if added by another comment.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change the first paragraph of 191.3.2.2 to read:

The PCS Transmit function shall conform to the PCS 64B/65B Transmit state diagram in Figure 191–18. The PCS Transmit bit ordering shall conform to Figure 191–11 for a 10G+100MBASE-T1/V1 PHY. For a 5G+100MBASE-T1/V1 or a 2.5GBASE-T1/V1 PHY, the PCS Transmit bit ordering shall conform to Figure 191-12.
Adjust PICS appropriately if added by another comment.

*Cl* **191** *SC* **191.3.2.2** *P* **76** *L* **34** # 6

Ran, Adee Cisco Systems

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

"L-interleaved RS-FEC which adds L × 340 parity bits."
L is used here before it is defined (although it can be inferred). The reader has to read into the next page to find the definition "L is called the interleaving depth, and the possible choices of L are 1, 2, and 4" (P77 L19). And prior to that there is another usage of this parameter "L-interleaved (L = 1, 2, or 4)" (P77 L8).

Also possibly in clause 192.

*SuggestedRemedy*

Edit to define the parameter L first and then use it.

Implement in clause 192 if appropriate.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

P77L19
Delete: L is called the interleaving depth, and the possible choices of L are 1, 2, and 4.

P76L33
Change: the PCS Transmit process take L groups of 50 65B blocks and append a 10-bit OAM field to each group.

To: the PCS Transmit process takes L groups of 50 65B blocks, where L is the interleaving depth, and the possible choices of L are 1, 2, and 4. A 10-bit OAM field is appended to each group.

*Cl* **191** *SC* **191.3.2.2** *P* **76** *L* **35** # 42

Muma, Scott Microchip

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

L35-37 and L39-41 are saying nearly the same thing in 2 slightly different ways. Combine to remove repetition.

*SuggestedRemedy*

Combine L35-41 as: These bits are then mapped, two at a time, into a PAM4 symbol for 10G and one at a time into a PAM2 symbol for 2.5G and 5G. In each symbol period transmit data-units are sent to the PMA service interface via the PMA_UNITDATA.request primitive. The symbol period, T, is 1000 / (5.625 × S) ps. See Table 201–1 for the definition of S.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.3.2.2** *P* **76** *L* **40** # 509

Razavi, Alireza Eliyan

*Comment Type* **E** *Comment Status* **A** *late - EZ*

Several sentences in Clause 191 use passive voice where an active construction would read more directly and better matches preferred 802.3 drafting style. Example — 191.3.2.2 (p76) states: “The operation of the PCS Transmit function is controlled by the PMA_TXMODE.indication message received from the PMA PHY Control function.” The acting entity (the PMA_TXMODE.indication message) appears after the verb. Suggested active form and additional instances are given in the Proposed Change column.

*SuggestedRemedy*

Convert the example to active voice: “The PMA_TXMODE.indication message, received from the PMA PHY Control function, controls the operation of the PCS Transmit function.” Apply the same passive-to-active conversion to the following instances: (a) p63 191.1.3 — “Each of these 276-bit blocks is formed into an RS-FEC input frame, then encoded by the RS-FEC(50,46,6)” → “The PCS forms each 276-bit block into an RS-FEC input frame, then the RS-FEC(50,46,6) encoder encodes it.” (b) p64 191.1.4 — “the PCS is directed to generate only PAM2 symbols for transmission by the HS_TX PMA” → “PHY Control directs the PCS to generate only PAM2 symbols for the HS_TX PMA to transmit.” (c) p73 191.2.3 — “The pcs_data_mode variable is generated by the PMA PHY Control function” → “The PMA PHY Control function generates the pcs_data_mode variable.” (d) p85 191.3.2.3 — “Frames that cannot be corrected are marked with error symbols by the decoder” → “The decoder marks frames that cannot be corrected with error symbols.” (e) p96 191.3.6 — “This status is set by the PHY to indicate the status of the receiver” → “The PHY sets this status to indicate the status of the receiver.” These are editorial improvements only; no normative change is intended. Passive voice remains acceptable where the acting entity is genuinely unimportant or unknown.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.3.2.2** *P* **77** *L* **7** # 504

Razavi, Alireza Eliyan

*Comment Type* **E** *Comment Status* **A** *late - EZ*

Long sentence (43 words) reduces readability. Current text: “If a PMA_TXMODE.indication message has the value SEND_N, the PCS is in the data mode of operation and the PCS Transmit function shall use a 65B coding technique to generate, at each symbol period, code-groups that represent data or control.”

*SuggestedRemedy*

Replace with two sentences: “If a PMA_TXMODE.indication message has the value SEND_N, the PCS is in the data mode of operation. In data mode, the PCS Transmit function shall use a 65B coding technique to generate, at each symbol period, code-groups that represent data or control.”

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.3.2.2** *P* **77** *L* **15** # 505

Razavi, Alireza Eliyan

*Comment Type* **E** *Comment Status* **A** *late - EZ*

Long sentence (38 words) reduces readability. Current text: “During data encoding, PCS Transmit utilizes L-interleaved (L = 1, 2, or 4) Reed-Solomon encoders to generate and append 340 parity check bits to form 3600-bit (360,326) RS-FEC frames that are interleaved into an L-interleaved RS-FEC superframe.”

*SuggestedRemedy*

Replace with two sentences: “During data encoding, PCS Transmit uses L-interleaved (L = 1, 2, or 4) Reed-Solomon encoders to generate and append 340 parity check bits, forming 3600-bit (360,326) RS-FEC frames. These frames are interleaved into an L-interleaved RS-FEC superframe.”

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.3.2.2** *P* **77** *L* **17** # 289

van Dyck, Peter Infineon

*Comment Type* **E** *Comment Status* **A** *EZ - pull*

Missing distinction between 2.5/5G and 10G regarding PAM2/PAM4 usage during data mode.

*SuggestedRemedy*

Replace:
The bits of the RS-FEC superframe are then scrambled by the PCS using an additive PCS scrambler, encoded in PAM4 symbols, and transferred to the PMA.
With:
The bits of the RS-FEC superframe are then scrambled by the PCS using an additive PCS scrambler, encoded in PAM4 symbols in 10G and PAM2 symbols in 2.5G/5G, and transferred to the PMA.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.3.2.2** *P* **77** *L* **19** # 7

Ran, Adee Cisco Systems

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

"The interleaver settings requested in each direction of transmission may be different"

But this subclause describes the HS_PATH which has only one direction. The LS_PATH seems to have no interleaving.

Also possibly in clause 192.

*SuggestedRemedy*

Clarify or delete this sentence.

Implement in clause 192 if appropriate.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Delete: The interleaver settings requested in each direction of transmission may be different

This comment does not apply to Clause 192.

*Cl* **191** *SC* **191.3.2.2** *P* **77** *L* **22** # 506

Razavi, Alireza Eliyan

*Comment Type* **E** *Comment Status* **A** *late - EZ*

Long sentence (36 words) reduces readability. Current text: “The interleaver settings requested in each direction of transmission may be different, and the value of L used by the transmitter is determined by the link partner and signaled during the PAM2 training mode Infofield exchange.”

*SuggestedRemedy*

Replace with two sentences: “The interleaver settings requested in each direction of transmission may be different. The link partner determines the value of L used by the transmitter, and signals it during the PAM2 training mode Infofield exchange.”

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.3.2.2** *P* **77** *L* **30** # 124

de Koos, Andras — Microchip Technology

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

In figure Figure 191–9, the bits Dn[0] and Dn[1] are reversed. Dn[0] should be XORed with DSn[0] and Dn[1] should be XORed with DSn[1], at least according to Clause 149.

*SuggestedRemedy*

Please correct figure 191–9.

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **191** *SC* **191.3.2.2** *P* **77** *L* **30** # 493

Cheng, Xiaoyue — Infineon

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

HS_PATH 10G encoding is expected to be consistent with MGBT1, but Figure 191-9 shows DSn[0] XOR with Dn[1] and DSn[1] XOR with Dn[0]

*SuggestedRemedy*

swap Dn[1] and Dn[0] so that DSn[0] XOR with Dn[0], and DSn[1] XOR with Dn[1]

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **191** *SC* **191.3.2.2** *P* **77** *L* **31** # 405

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

Figure 191-9 incorrectly has Dn[1] xored with DSn[0] and Dn[0] xored with DSn[1]. According to 149.3.2.2.18, which is referenced in by 191.3.2.2.17, it should be the other way around (0 with 0 and 1 with 1). (note that DSn[0] and DSn[1] appear to be formed correctly)

*SuggestedRemedy*

In Figure 191-9, change Dn[0] to Dn[1] and Dn[1] to Dn[0]

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **191** *SC* **191.3.2.2** *P* **77** *L* **32** # 43

Muma, Scott — Microchip

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

Dn[0] and Dn[1] are reversed from the explanation in 149.3.2.2.18

*SuggestedRemedy*

In Figure 201-9 swap Dn[0] and Dn[1].

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **191** *SC* **191.3.2.2** *P* **79** *L* **31** # 285

van Dyck, Peter — Infineon

*Comment Type* **E** *Comment Status* **A** *EZ - pull*

Figure 191-11: For 10G, a RS-FEC superframe always has L x 1800 PAM4 symbols. A Training frame always has 7200 PAM2 symbols. The training frame symbols match the data path symbols for a case with L=4

*SuggestedRemedy*

Replace:
RS-FEC superframe (L × 1800 × u symbols)
With:
RS-FEC superframe (L × 1800 symbols) / Training Frame (u x 1800 symbols)

Replace:
For PAM2 path, V=2 and u=2
With:
For PAM2 path, V=2 and u=4

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace:
RS-FEC superframe (L × 1800 × u symbols)

With:
RS-FEC superframe (L × 1800 symbols) / Training Frame (7200 symbols)

Replace Note 3 With:
For RS-FEC Frame V=4, u=1. For Training Frame V=2, u=4.

*Cl* **191** *SC* **191.3.2.2** *P* **80** *L* **29** # 286

van Dyck, Peter Infineon

*Comment Type* **E** *Comment Status* **A** *EZ - pull*

Figure 191-12: For 2.5G and 5G, a RS-FEC superframe always has L x 3600 PAM2 symbols. A Training frame always has 7200 PAM2 symbols. The training frame symbols match the data path symbols for a case with L=2

*SuggestedRemedy*

Replace:
RS-FEC superframe (L × 1800 × u symbols)
With:
RS-FEC superframe (L × 3600 symbols) / Training Frame (7200 symbols)

Replace:
For PAM2 path, V=2 and u=2
With:
For RS-FEC Frame u=1. For Training Frame u=2.

Replace:
PAMVu x 1800-1
With:
PAM2u x 3600-1

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace:
RS-FEC superframe (L × 1800 × u symbols)

With:
RS-FEC superframe (L × 3600 symbols) / Training Frame (7200 symbols)

Replace:
For PAM2 path, V=2 and u=2

With:
For RS-FEC Frame u=1. For Training Frame u=2.

Replace:
PAMVu x 1800-1

With:
PAM2u x 3600-1

Replace PAMV with PAM2

*Cl* **191** *SC* **191.3.2.2** *P* **81** *L* **43** # 287

van Dyck, Peter Infineon

*Comment Type* **E** *Comment Status* **A** *EZ - pull*

Figure 191-13: Same as comment for Figure 191-11

*SuggestedRemedy*

Replace:
For PAM2 path, V=2 and u=2
With:
For PAM2 path, V=2 and u=4

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace Note 3 With:

For RS-FEC Frame V=4, u=1. For Training Frame V=2, u=4.

*Cl* **191** *SC* **191.3.2.2** *P* **82** *L* **43** # 288

van Dyck, Peter Infineon

*Comment Type* **E** *Comment Status* **A** *EZ - pull*

Figure 191-14: Same as comment for Figure 191-12

*SuggestedRemedy*

Replace:
For PAM2 path, V=2 and u=2. For PAM4 path, V=4 and u=1.
With:
For RS-FEC Frame u=1. For Training Frame u=2.

Replace:
rx_PAMVn+(u x 1800-1)
With:
rx_PAM2n+(u x 3600-1)

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.3.2.2.1** *P* **78** *L* **22** # 424

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

Use of blocks, notation, structure, control codes and encodings of control characters is identical for low speed and high speed.

*SuggestedRemedy*

Insert "The use of blocks, notation, block structure, control codes, and encoding of ordered sets, idle, start, terminate, and error characters is identical for the high speed path as for the low speed path." at P78 L29 as a new last paragraph to 191.3.2.2.1.

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **191** *SC* **191.3.2.2.3** *P* **78** *L* **43** # 363

Lasry, Ariel — Qualcomm Technologies, Inc.

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

It refers to 149.3.2.2.3. But 149.3.2.2.3 includes Figure 149-7 "PCS Receive bit Ordering" which is not applicable to Clause 191

*SuggestedRemedy*

Copy the text from 149.3.2.2.3 to this Sub-clause and replace Figure 149-7 with Figures 191-13 and 191-14

*Response* *Response Status* **W**

ACCEPT.

---

*Cl* **191** *SC* **191.3.2.2.4** *P* **78** *L* **47** # 364

Lasry, Ariel — Qualcomm Technologies, Inc.

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

The referenced 149.3.2.2.4 includes the following text "The format of the blocks for MultiGBASE-T1 is as shown in Figure 149–8". However MultiGBASE-T1 is not defined for Clause 191 and it should also apply to V1

*SuggestedRemedy*

Add "With MultiGBASE-T1 replaced with MultiG+100M/100M+MultiGBASE-T1/V1." Alternatively update Clause 149.3.2.2.4 to include "MultiG+100M/100M+MultiGBASE-T1/V1".

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Add "With MultiGBASE-T1 replaced with MultiG+100M/100M+MultiGBASE-T1/V1."

---

*Cl* **191** *SC* **191.3.2.2.5** *P* **78** *L* **50** # 410

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

149.3.2.2.5 has requirements in it - these need to be called out with a shall.

*SuggestedRemedy*

Either bring in the text of 149.3.2.2.5 or, change "See 149.3.2.2.5" to "Control codes shall be encoded as specified in 149.3.2.2.5." add PICS to PCT section, copying PICS PCT8 in Clause 149.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change: See 149.3.2.2.5.

To: Control codes shall be encoded as specified in 149.3.2.2.5.
Add PICS to PCT section, copying PICS PCT8 in Clause 149.

---

*Cl* **191** *SC* **191.3.2.2.5** *P* **78** *L* **51** # 365

Lasry, Ariel — Qualcomm Technologies, Inc.

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

The referenced 149.3.2.2.5 includes the following text "2.5G/5G/10GBASE-T1" which is not relevant for clause 191

*SuggestedRemedy*

Add "With 2.5G/5G/10GBASE-T1 replaced with MultiG+100M/100M+MultiGBASE-T1/V1." Alternatively update Clause 149.3.2.2.5 to include "MultiG+100M/100M+MultiGBASE-T1/V1".

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Accommodated by #410.

*Cl* **191** *SC* **191.3.2.2.5** *P* **79** *L* **1** # 123

de Koos, Andras — Microchip Technology

*Comment Type* **E** *Comment Status* **R** *191_PCS*

In figure 191–11, only L=1 is shown (just like in clause 149) . Rather than having to refer to the full explanation of the superframe and interleave depth in clause 149 (where it is still somewhat cryptic), an illustration of how the RS-FEC frames are interleaved into a superframe would be helpful, and would fit well into this diagram.

Same comment for figures 191–13, 192–6, and 192–13

*SuggestedRemedy*

In figure 191–11 (and similar HS PCS bit ordering diagrams), consider showing the figure with interleave depth L=2 or L=4.

*Response* *Response Status* **C**

REJECT.

The CRG does not see a need to make a change. It is up to the implenter to determine how to do this.

*Cl* **191** *SC* **191.3.2.2.5** *P* **79** *L* **38** # 361

Lasry, Ariel — Qualcomm Technologies, Inc.

*Comment Type* **ER** *Comment Status* **R** *191_PCS*

Figure 191-11 is at the wrong Sub-Clause

*SuggestedRemedy*

Move to 191.3.2.2.2 line 40

*Response* *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **191** *SC* **191.3.2.2.6** *P* **79** *L* **42** # 503

Razavi, Alireza — Eliyan

*Comment Type* **E** *Comment Status* **A** *late - EZ*

191.3.2.2.6 “Ordered sets” is a modified-adoption reference: “See 149.3.2.2.6. LPI, /LI/ is not used by MultiG+100MBASE-T1/V1 PHYs.” The reader must open Clause 149.3.2.2.6, then mentally subtract the LPI/ /LI/ content, to know the actual requirement.

*SuggestedRemedy*

Rewrite so the net requirement is stated locally, e.g., “Ordered sets are as specified in 149.3.2.2.6, except that LPI signaling and the /LI/ ordered set are not used by MultiG+100MBASE-T1/V1 PHYs. All other ordered sets defined in 149.3.2.2.6 apply unchanged.”

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.3.2.2.6** *P* **79** *L* **43** # 518

Razavi, Alireza — Eliyan

*Comment Type* **E** *Comment Status* **A** *late - EZ*

Typo: “MutltiG+100MBASE-T1/V1” has a misspelling (“Mutlti”).

*SuggestedRemedy*

Correct to “MultiG+100MBASE-T1/V1”.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

If comment #501 is accepted

Change: MutltiG+100MBASE-T1/V1

To: PHY_S

If comment #501 is rejected, do the suggested remedy.

*Cl* **191** *SC* **191.3.2.2.7** *P* **79** *L* **47** # 411

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

149.3.2.2.7 has requirements in it - these need to be called out with a shall.

*SuggestedRemedy*

Either bring in the text of 149.3.2.2.7 or, change "See 149.3.2.2.7" to "Idles shall be encoded as specified in 149.3.2.2.7." add PICS to PCT section, copying PICS PCT9, 10 & 11 in Clause 149.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change: See 149.3.2.2.7.
To: Idles shall be encoded as specified in 149.3.2.2.7.
Add PICS to PCT section, copying PICS PCT9, 10 & 11 in Clause 149.

*Cl* **191** *SC* **191.3.2.2.8** *P* **80** *L* **35** # 45

Muma, Scott — Microchip

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

There is no PAM4 path shown in this figure.

*SuggestedRemedy*

Replace V with 2, and u with 2 and simplify math in Figure 201-14, remove Note 3.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by #286.

*Cl* **191** *SC* **191.3.2.2.8** *P* **80** *L* **37** # 362

Lasry, Ariel — Qualcomm Technologies, Inc.

*Comment Type* **ER** *Comment Status* **R** *191_PCS*

Figure 191-12 is at the wrong Sub-clause

*SuggestedRemedy*

Move to 191.3.2.2.2 after Figure 191-11 from previous comment

*Response* *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **191** *SC* **191.3.2.2.11** *P* **80** *L* **46** # 412

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

149.3.2.2.11 has requirements in it - these need to be called out with a shall.

*SuggestedRemedy*

Either bring in the text of 149.3.2.2.11 or, change "See 149.3.2.2.11" to "Idles shall be encoded as specified in 149.3.2.2.11." add PICS to PCT section, copying PICS PCT14 in Clause 149

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change: See 149.3.2.2.11.
To: Idles shall be encoded as specified in 149.3.2.2.11.
Add PICS to PCT section, copying PICS PCT14 in Clause 149

*Cl* **191** *SC* **191.3.2.2.11** *P* **80** *L* **51** # 366

Lasry, Ariel — Qualcomm Technologies, Inc.

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

The referenced Sub-clause 149.3.2.2.12 is referring to definitions of R_BLOCK_TYPE and T_BLOCK_TYPE in 149.3.7.2.4. It is better to use the definition in 191.3.5.1.4

*SuggestedRemedy*

Copy the text from 149.3.2.12 to line 51 and replace 149.3.7.2.4 with 191.3.5.1.4

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Replace text in 191.3.2.2.11 with:
The /E/ is sent whenever an /E/ is received. The /E/ allows physical sublayers such as the PCS to propagate received errors. See R_BLOCK_TYPE and T_BLOCK_TYPE function definitions in 191.3.5.1.4 for further
information.

Cl **191** SC **191.3.2.2.12** P **82** L **1** # 122

de Koos, Andras — Microchip Technology

*Comment Type* **ER** *Comment Status* **A** *191_PCS*

Placement of figure 191–13 and 191–14 - the receive bit ordering diagrams - is within the transmit function section. Very confusing.

*SuggestedRemedy*

please move figures 191–13 and 191–14 to the receive function section.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

P78L36
Change: Figure 191–11 for 10G transmit, Figure 191–12 for 2.5G and 5G transmit, Figure 191–13 for 10G receive, and Figure 191–14 for 2.5G and 5G receive.

To: Figure 191–11 for 10G transmit and Figure 191–12 for 2.5G and 5G transmit.

Move the anchors for Figure 191-13 and 191-14 to their new first reference paragraph on P84 in 191.3.2.3.

Cl **191** SC **191.3.2.2.12** P **82** L **43** # 44

Muma, Scott — Microchip

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

There is no PAM4 path shown in this figure.

*SuggestedRemedy*

Replace V with 2, and u with 2 and simplify math in Figure 201-14, remove Note 3.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by #288.

Cl **191** SC **191.3.2.2.14** P **83** L **24** # 413

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

149.3.2.2.15 has requirements in it - these need to be called out with a shall.

*SuggestedRemedy*

Either bring in the text of 149.3.2.2.15 or, change "See 149.3.2.2.15" to "RS-FEC superframes shall be interleaved as specified in 149.3.2.2.15." add PICS to PCT section, copying PICS PCT16, 17, and 18 in Clause 149

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change: See 149.3.2.2.15.

To: RS-FEC superframes shall be interleaved as specified in 149.3.2.2.15.

Add PICS to PCT section, copying PICS PCT16, 17, and 18 in Clause 149

Cl **191** SC **191.3.2.2.14** P **83** L **24** # 367

Lasry, Ariel — Qualcomm Technologies, Inc.

*Comment Type* **ER** *Comment Status* **A** *191_PCS*

The referenced Sub-clause 149.3.2.2.15 is referencing the InterleaverDepth from 149.4.2.4.5 where only 1 PHY Capbility bits is specified. For Clause 191 there are 2 PHY capabilities one for the HS_PATH one for the LS_PATH. The Sub-clause also mentions specific PHYs for 802.3ch which are not relevant to Clause 191

*SuggestedRemedy*

Replace line 24 with text from 149.3.2.2.15 and replace the reference 149.4.2.4.5 with 191.5.2.4.5. And replace the 3 listed .3ch PHYs with the corresponding Clause 191 PHYs.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Insert the following after the text added by #413:

with the exception that 2.5GBASE-T1 is replaced by 2.5G+100MBASE-T1/V1, 5GBASE-T1 is replaced by 5G+100MBASE-T1/V1, and 10GBASE-T1 is replaced by 10G+100MBASE-T1/V1.

*Cl* **191** *SC* **191.3.2.2.14** *P* **83** *L* **24** # 147

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

*Comment Type* **T** *Comment Status* **A** *191_PCS*

Reference to 149.3.2.2.15 needs to be replaced with text to refer to specific Clause 191 requirements.

*SuggestedRemedy*

Copy in text from 149.3.2.2.15 replacing 149.4.2.4.5 with 191.5.2.4.5.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by #413.

*Cl* **191** *SC* **191.3.2.2.17** *P* **83** *L* **35** # 406

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

The text of 149.3.2.2.18 references the scrambler in clause 149 which is different from clause 191, creating an error. Either the text needs to be brought in, with the reference to 149.3.4 changed to 191.3.2.2.19, or the text needs to note the change of scrambler.

*SuggestedRemedy*

Either: bring in the text of 149.3.2.2.18, changing the reference to 149.3.4 to 191.3.2.2.19
OR
Change the text of 191.3.2.2.17 to "As specified in 149.3.2.2.18, with the exception that the scrambler defined in 191.3.2.2.19 is used in place of the scrambler in 149.3.4".

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change the text of 191.3.2.2.17 to "As specified in 149.3.2.2.18, with the exception that the scrambler defined in 191.3.2.2.19 is used in place of the scrambler in 149.3.4".

*Cl* **191** *SC* **191.3.2.2.18** *P* **83** *L* **44** # 290

van Dyck, Peter — Infineon

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

Figure 191-10 shows Dn not Dn[0].

*SuggestedRemedy*

Replace:
All incoming PAM2 path HS_RX (5 Gb/s and 2.5 Gb/s) data bits are Dn, which are represented in
Figure 191–10 as Dn[0].
With:
All incoming PAM2 path HS_RX (5 Gb/s and 2.5 Gb/s) data bits are Dn, as shown in Figure 191-10.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Should be HS_TX, not HS_RX.
Replace:
All incoming PAM2 path HS_RX (5 Gb/s and 2.5 Gb/s) data bits are Dn, which are represented in Figure 191–10 as Dn[0].
With:
All incoming PAM2 path HS_TX (5 Gb/s and 2.5 Gb/s) data bits are Dn, as shown in Figure 191-10.

*Cl* **191** *SC* **191.3.2.2.18** *P* **83** *L* **44** # 322

Simms, William — NVIDIA

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

All incoming PAM2 path HS_RX'. Is this a typo? I thought we are in the HS_TX section

*SuggestedRemedy*

fix if typo confirmed

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change: HS_RX
To: HS_TX

*Cl* **191** *SC* **191.3.2.2.19** *P* **84** *L* **3** # 377

Lasry, Ariel — Qualcomm Technologies, Inc.

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

PHY_S PCS Transmit includes both the HS and LS transmit paths. It could be misleading

*SuggestedRemedy*

Replace "PHY_S" with "PHY_S HS_TX" 2 times on line 3 and 1 time on line 4

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.3.2.2.19** *P* **84** *L* **9** # 80

Ran, Adee — Cisco Systems

*Comment Type* **T** *Comment Status* **A** *191_PCS*

"An implementation of side-stream scramblers by linear-feedback shift registers is shown in Figure 149–11"
Figure 149-11 shows two scramblers and uses the labels MASTER and SLAVE to distinguish them. But these terms are not used in 802.3dm.
If a reference to content in clause 149 is used, it should state which one is used. Based on equation 191-2, which has the same polynomial as equation 149-6, it is the "MASTER" one

Also in 191.4.2.2.16, but there it is the MASTER polynomial.

The suggested remedy is to point back to the respective polynomial equations in clause 149. Alternatively the equations can be retained, but the reference to figure 149-11 should be specific.

*SuggestedRemedy*

Replace the first paragraph of 191.3.2.2.19, equation 191-2, and the quoted sentence by the following:

"The PHY_S PCS Transmit function shall employ side-stream scrambling using the generator polynomial specified in Equation (149-6) for both LEADER and FOLLOWER PHY configurations. An implementation of the side-stream scrambler by a linear-feedback shift register is shown in the bottom part of Figure 149–11 (labeled SLAVE PHY)."

Implement corresponding changes in 191.4.2.2.16 (using equation 149-5 and MASTER PHY).

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

See #378

*Cl* **191** *SC* **191.3.2.2.19** *P* **84** *L* **10** # 378

Lasry, Ariel — Qualcomm Technologies, Inc.

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

The referenced Figure 149-11 depicts 2 scrambler and talks about MASTER and SLAVE PHY Transmit. In Clause 191 only the bottom figure would apply and is valid for both LEADER and FOLLOWER.

*SuggestedRemedy*

Add a new Figure with the content of the bottom of Figure 149-11 without the text

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

PHY_D uses the top scrambler in Figure 149-11: In 191.4.2.2.6 create a Figure with the "MASTER PHY" scrambler and refer to this Figure instead of 149-11.

PHY_S uses the bottom scrambler in Figure 149-11: In 191.3.2.2.19 create a Figure with the "SLAVE PHY" scrambler and refer to this Figure instead of 149-11.

*Cl* **191** *SC* **191.3.2.2.20** *P* **84** *L* **21** # 414

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

149.3.2.2.19 has requirements in it - these need to be called out with a shall. The text also does not appropriately call out that PAM4 is only used for 10 Gb/s transmission.

*SuggestedRemedy*

Change "See 149.3.2.2.19" to "For 10 Gb/s transmit rate, bit pairs shall be gray-mapped for PAM4 encoding as specified in 149.3.2.2.19." add PICS to PCT section, copying PICS PCT19 in Clause 149, with status 10 Gb/s * PHY_S: M

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.3.2.2.21** *P* **84** *L* **25** # 415

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

149.3.2.2.20 has requirements in it - these need to be called out with a shall. The text also does not appropriately call out that PAM4 is only used for 10 Gb/s transmission.

*SuggestedRemedy*

Change "See 149.3.2.2.20" to "For 10 Gb/s transmit rate, gray-coded PAM4 symbols shall be precoded as specified in 149.3.2.2.20" add PICS to PCT section, copying PICS PCT20 in Clause 149, with status 10 Gb/s * PHY_S: M

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.3.2.2.21** *P* **84** *L* **26** # 379

Lasry, Ariel — Qualcomm Technologies, Inc.

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

The referenced Sub-clause 149.3.2.2.20 refers to the Infofield messages in 149.4.2.4.5 which should actually refer to 191.5.2.4.5. This is used to select the precoder in 45.2.1.246.3. But I'm not sure if this register is also applicable for Clause 191. And It talks about EEE which is not applicable.

*SuggestedRemedy*

Add: "EEE not supported by MutltiG+100MBASE-T1/V1 and 100M+MultiGBASE-T1/V1 PHYs, The value of precoder_type shall be set to the value of PrecodeSel received from the link partner in the Infofield messages (see 191.5.2.4.5."

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Accommodated by #415.

*Cl* **191** *SC* **191.3.2.2.22** *P* **84** *L* **29** # 416

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

149.3.2.2.21 has requirements in it - these need to be called out with a shall. The text also does not appropriately call out that PAM4 is only used for 10 Gb/s transmission.

*SuggestedRemedy*

Change "See 149.3.2.2.21" to "For 10 Gb/s transmit rate,precoded PAM4 symbols shall be encoded as specified in 149.3.2.2.21" add PICS to PCT section, copying PICS PCT21 in Clause 149, with status 10 Gb/s * PHY_S: M

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.3.2.3** *P* **84** *L* **1** # 507

Razavi, Alireza — Eliyan

*Comment Type* **E** *Comment Status* **A** *late - EZ*

Long sentence (39 words) reduces readability. Current text: “The PCS Receive function shall conform to the PCS 64B/65B Receive state diagram in Figure 191–19 and the PCS Receive bit ordering in Figure 191–13 for 10 Gb/s and Figure 191–14 for 5 Gb/s and 2.5 Gb/s, including compliance with the associated state variables as specified in 191.3.5.1.2.”

*SuggestedRemedy*

Replace with two sentences: “The PCS Receive function shall conform to the PCS 64B/65B Receive state diagram in Figure 191–19, and to the PCS Receive bit ordering in Figure 191–13 for 10 Gb/s and Figure 191–14 for 5 Gb/s and 2.5 Gb/s. Conformance includes compliance with the associated state variables specified in 191.3.5.1.2.”

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.3.2.3** *P* **85** *L* **7** # 456

Law, David — HPE

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

Figure 191–17 'RFER monitor state diagram' uses the block_lock as an open arrow entry condition to the RFER_MT_INIT state, with subclause 191.3.5.1.2 'Variables' defining block_lock as a 'Boolean variable ...'. Further, subclause 191.3.6.1 'Status' says the block_lock bit 'Indicates the state of the block_lock variable.'. Subclause 191.4.2.3 and 191.3.2.3 'PCS Receive function', however, describe when the 'block_lock flag is de-asserted' and when the '... block_lock flag is re-asserted ...'.

*SuggestedRemedy*

Either change all instances of '... block_lock flag ...' to '... block_lock variable ...' or to just '... block_lock ...', as is used elsewhere in both subclauses 191.3.2.3 and 191.4.2.3.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change block_lock flag to block_lock.

*Cl* **191** *SC* **191.3.2.3** *P* **85** *L* **15** # 125

de Koos, Andras — Microchip Technology

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

How to synchronize the Rx descrambler state to that of the Tx (during training frames) is not spelled out.
"During PMA training mode, PCS Receive checks the received PAM2 framing and indicates the reliable acquisition of the PCS descrambler state by setting the scr_status parameter of the PMA_SCRSTATUS.request primitive to OK."
What does "reliable" mean?? how reliable is reliable enough? Needs a definition!
This is likely the same language and verbosity as similar clauses, but it would be beneficial for the standard to have a well-defined scrambler-state synchronization method.

Same comment for 192.3.2.3

*SuggestedRemedy*

consider adding an explicit method (state machine) for the scrambler state sync.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace P85L15-17, P105L1-3, and P188L51-53 in all three places

With:
During PMA training mode, PCS Receive checks the received PAM2 framing and indicates that the PCS descrambler state has been acquired by setting the scr_status parameter PMA_SCRSTATUS.request primitive to OK. Descrambler acquisition is a prerequisite to RS FEC block lock and should be robust to bit errors without RS-FEC.

Val to implement change on P188.

*Cl* **191** *SC* **191.3.2.3** *P* **85** *L* **22** # 508

Razavi, Alireza — Eliyan

*Comment Type* **E** *Comment Status* **A** *late - EZ*

Long sentence (40 words) reduces readability. Current text: “When the PCS Synchronization process has obtained synchronization, the RS-FEC frame error ratio (RFER) monitor state diagram shown in Figure 191–17 monitors the received signal for high RS-FEC frame error ratio and asserts hi_rfer to indicate excessive RS-FEC frame errors.”

*SuggestedRemedy*

Replace with two sentences: “When the PCS Synchronization process has obtained synchronization, the RS-FEC frame error ratio (RFER) monitor state diagram of Figure 191–17 monitors the received signal for a high RS-FEC frame error ratio. The monitor asserts hi_rfer to indicate excessive RS-FEC frame errors.”

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.3.2.3.1** *P* **85** *L* **40** # 407

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

the receiver concatenates indications, not requests. The same error is made on lines 40 and 46

*SuggestedRemedy*

replace "concatenating requests" with "concatenating indications" on P85 L40 and 46

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.3.2.3.1** *P* **85** *L* **46** # 294

van Dyck, Peter — Infineon

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

Reference to wrong Figure

*SuggestedRemedy*

Replace:
see Figure 191–13

With:
see Figure 191–14

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.3.2.3.1** *P* **85** *L* **46** # 323

Simms, William — NVIDIA

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

incorrect figure reference 191-13

*SuggestedRemedy*

I think it should point to 191-14 for PAM2

*Response* *Response Status* **W**

ACCEPT.

*Cl* **191** *SC* **191.3.2.3.3** *P* **86** *L* **16** # 276

Jonsson, Ragnar Infineon

*Comment Type* **E** *Comment Status* **D** *EZ - pull*

There should be a SHALL statement in "The R_BLOCK_TYPE of an invalid block is set to E."

*SuggestedRemedy*

Change to "The R_BLOCK_TYPE of an invalid block shall be set to E."

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Also update proposed PICS as appropriate.

*Cl* **191** *SC* **191.3.3** *P* **86** *L* **21** # 417

Zimmerman, George CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

*Comment Type* **T** *Comment Status* **A** *191_tests*

149.3.3 Test pattern generators has requirements in it. Further, those requirements relate to the bit ordering figures in clause 149, which are only valid for 10 Gb/s and not for 2.5 Gb/s and 5 Gb/s. This section needs reworking to be simpler - better to bring it in.

*SuggestedRemedy*

Replace "As specified in 149.3.3." with
"The test-pattern generator mode is provided for enabling joint testing of the local transmitter, the channel,
and remote receiver. When the transmit PCS is operating in test-pattern mode it shall transmit continuously
according to the appropriate rate's transmit bit ordering diagram (Figure 191-11 or Figure 191-12), with the input to the RS-FEC encoder set to zero and the initial condition of the scrambler set to any non-zero value. This has the same effect as setting the input to the scrambler to zero.
When the receiver PCS is operating in test-pattern mode it shall receive continuously according to the appropriate rate's receive bit ordering diagram (Figure 191-13 or Figure 191-14). The output of the received descrambled values should be zero. Any nonzero values correspond to receiver bit errors. The output of the RS-FEC decoder should also be zero; however, there is
the possibility that the RS-FEC decoder corrected some errors. This mode is further described as test mode 7 in 191.1.6."
Insert PICS duplicating PICS TPG1, with status PHY_S: M, and TPG2, with status PHY_D: M.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.3.5.1.2** *P* **88** *L* **33** # 457

Law, David HPE

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

Since subclause 191.3.2.3 'PCS Receive function' says that 'The PCS Synchronization process sets the block_lock flag to indicate whether the PCS has obtained synchronization.', suggest that subclause 191.3.5.1.2 'Variables' description of the block_lock variable reference the PCS Synchronization process.

*SuggestedRemedy*

Suggest that the text 'Boolean variable that is set TRUE when receiver acquires block delineation.' be updated to read 'Boolean variable that is set TRUE by the PCS Synchronization process when it acquires block delineation.'.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.3.5.1.3** *P* **88** *L* **25** # 215

Slavick, Jeff Broadcom

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

Timers have a duration, not a trigger. It appears you want to have a timer that continously restarts over and over again.

*SuggestedRemedy*

Update the timer to be defined as "Timer with a duration of 125us/ 4*S + 1%, -25%. Upon completition of the timer duration the timer is immediately restarted. See Table 191-1 for the definition of S."

*Response* *Response Status* **C**

ACCEPT.

This is on P89L25.

This text is deleted by #52.

*Cl* **191** *SC* **191.3.5.1.3** *P* **88** *L* **25** # 214

Slavick, Jeff — Broadcom

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

rfer_timer_done is not used anywhere and automatically exists per 14.2.3.2

*SuggestedRemedy*

Remove "When the timer reaches its terminal count, rfer_timer_done = TRUE."

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

This is on P89L25.

This text is deleted by #52.

*Cl* **191** *SC* **191.3.5.1.3** *P* **88** *L* **25** # 216

Slavick, Jeff — Broadcom

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

rfer_timer is not used within Clause 191, why is it here?

*SuggestedRemedy*

Move rfer_timer to Clause 192.3.5.x

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by #52.

This is deleted from 192.

*Cl* **191** *SC* **191.3.5.1.3** *P* **89** *L* **22** # 52

Muma, Scott — Microchip

*Comment Type* **E** *Comment Status* **D** *variables*

rfer_timer is the only timer defined and is never used, so the Timers section and subsections can be deleted.

*SuggestedRemedy*

Delete section 191.3.5.1.3 and rfer_timer definition.

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT.

*Cl* **191** *SC* **191.3.5.1.4** *P* **89** *L* **35** # 418

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

Duplicate shall - the entire state diagram of figure 191-18 is required, having a shall only on the DECODE and ENCODE functions is duplicative.

*SuggestedRemedy*

Change "shall decode" to "decodes" at P89 L35 (DECODE desciption)
Change "shall encode" to "encodes" at P89 L40 (ENCODE description)

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.3.5.1.4** *P* **90** *L* **39** # 520

Muma, Scott — Microchip Technology Inc.

*Comment Type* **E** *Comment Status* **D** *late-2*

T_TYPE_NEXT is defined but never used

*SuggestedRemedy*

Delete text lines 39-41: T_TYPE_NEXT
Prescient end of packet check function. It returns the T_BLOCK_TYPE of the tx_raw vector immediately following the current tx_raw vector.

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT.

*Cl* **191** *SC* **191.3.5.2** *P* **94** *L* **1** # 419

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

Text should refer to the actual diagrams.Additionally, the 64B/65B state diagrams are required elsewhere in the text - Figure 191-19 is already there and Figure 191-18's requirement earlier is subject to an earlier comment of mine. These other two figures are described in the previous paragraphs so are unnecessary.

*SuggestedRemedy*

Change "The PCS shall perform the functions of RFER monitor, Transmit, and Receive as specified in these state
diagrams."
To "The PCS shall monitor for errors in the RS-FEC decoding as specified in Figure 191-17."

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.3.5.2** *P* **94** *L* **31** # 458

Law, David HPE

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

Move the transition condition 'R_TYPE(rx_coded) = T * R_TYPE_NEXT = (S + C)' to the right so it is clear that it is associated with the RX_D to RX_T transition in Figure 191–19 'PCS 64B/65B Receive state diagram'.

*SuggestedRemedy*

See comment.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.3.5.2** *P* **94** *L* **36** # 459

Law, David HPE

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

Move the transition condition 'R_TYPE(rx_coded) = T * R_TYPE_NEXT = (S + C)' to the right so it is clear that it is associated with the RX_E to RX_T transition in Figure 191–19 'PCS 64B/65B Receive state diagram'.

*SuggestedRemedy*

See comment.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.3.6.1** *P* **95** *L* **8** # 212

Slavick, Jeff Broadcom

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

Appears the pcs_status is considered a boolean variable. That should be indicated.

*SuggestedRemedy*

Insert "Boolean variable that" as the first words of the definition for pcs_status

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.3.6.1** *P* **95** *L* **14** # 213

Slavick, Jeff Broadcom

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

Seems like this section is specifying what PCS variables are to defnitively be made available to management entities. Along with their mapping to MDIO register bits. For block_lock and hi_rfer these are named the same as the state diagram variables and this text implies they're identical including the names. So aren't they really the state diagram variables?

*SuggestedRemedy*

Change the first sentence of block_lock definition to be: The state diagram variable block_lock (see 191.3.5.1.2).
Change the first sentence of hi_rfer definition to be: The state diagram variable hi_rfer (see 191.3.5.1.2).

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.3.7** *P* **95** *L* **38** # 421

Zimmerman, George CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

*Comment Type* **T** *Comment Status* **A** *EZ - pull*

The OAM behavior in 149.3.9 (including state diagrams Figure 149-24 and Figure 149-25) are not pulled in as requirements. They should be.

*SuggestedRemedy*

Change P95 L38 from "behavior is defined in 149.3.9" to "behavior shall be as defined in 149.3.9" add PICS as appropriate (see PICS comment)

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Make the change suggested.

NOTE: No changes are being made to Clause 149.

In addition, update 192.3.7 as shown in https://www.ieee802.org/3/dm/public/0726/8023-192_3_7%20-%20OAM%20edits.pdf.

*Cl* **191** *SC* **191.3.7** *P* **95** *L* **38** # 148

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

improve wording

*SuggestedRemedy*

Change: exchanging PHY link health status and message exchange.
To: exchanging PHY link health status and messages.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.3.7.2** *P* **96** *L* **1** # 420

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

*Comment Type* **T** *Comment Status* **D** *EZ - pull*

The OAM functions in 149.3.9.2 are not pulled in with requirement language. Further, the exceptions, are not only in 191.3.7.2.1, but are also in .2 (PHY Health) and .3 (PHY health indicator).
After requiring 191.3.7.2.1, there will be duplicate shalls...

*SuggestedRemedy*

Change 191.3.7.2 to from : "MultiG+100MBASE-T1/V1 OAM functions are the same as those defined for a MultiGBASE-T1 PHY in 149.3.9.2 with the exception that the MultiG+100MBASE-T1/V1 OAM frame structure, PHY health, and PHY health indicator are defined in 191.3.7.2.1."
to: "MultiG+100MBASE-T1/V1 OAM functions shall be as defined for a MultiGBASE-T1 PHY in 149.3.9.2 with the exception that the MultiG+100MBASE-T1/V1 OAM frame structure, PHY health, and PHY health indicator are defined in 191.3.7.2.1, 191.3.7.2.2, and 191.3.7.2.3, respectively."
Add pics reflecting sections of 149 and 191.3.7.2.2
Change "the first symbol (OAM<0>) shall be" to "the first symbol (OAM<0>) is" at P96 L21 (4th para 191.3.7.2.1)
Change "10-bit OAM field shall be set to all 0's" to "10-bit OAM field is set to all 0's." at P96 L31 (last para 191.3.7.2.1)

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT.

*Cl* **191** *SC* **191.4.1** *P* **97** *L* **15** # 8

Ran, Adee — Cisco Systems

*Comment Type* **T** *Comment Status* **A** *EZ - pull*

"The XGMII is running at 1/100th the rate of 10 Gb/s, 1/50th the rate of 5 Gb/s, and 1/25th the rate of 2.5 Gb/s"
This is a convoluted way of stating a simple thing.

Also possibly in clause 192.

*SuggestedRemedy*

Change to "The XGMII runs at 100 Mb/s".

Implement in clause 192 if appropriate.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change: The XGMII is running at 1/100th the rate of 10 Gb/s, 1/50th the rate of 5 Gb/s, and 1/25th the rate of 2.5 Gb/s.

To: The nominal transmit or receive bit rate of the XGMII for the LS_Path is 100 Mb/s.

This does not apply to Clause 191.3.1 or Clause 192.

Cl **191** SC **191.4.2** P **97** L **22** # 149

Wienckowski, Natalie IVN Solutions LLC; Ethernovia & Bosch

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

improve wording and add OAM

*SuggestedRemedy*

Change: The LS_PATH PCS operating functions are the LS_TX PCS Transmit in the PHY_D device, and the LS_RX PCS Receive in the PHY_S device.
To: The LS_PATH PCS comprises the following functions: PCS Reset, LS_TX PCS Transmit in the PHY_D device, the LS_RX PCS Receive in the PHY_S device, and an optional PCS OAM. The PCS Transmit and PCS Receive functions execute simultaneously and asynchronously.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

There is a typo in the suggested remedy. The second sentence is already in the text and isn't included in what to change.

Change: The LS_PATH PCS operating functions are the LS_TX PCS Transmit in the PHY_D device, and the LS_RX PCS Receive in the PHY_S device.
To: The LS_PATH PCS comprises the following functions: PCS Reset, LS_TX PCS Transmit in the PHY_D device, the LS_RX PCS Receive in the PHY_S device, and an optional PCS OAM.

Cl **191** SC **191.4.2.1** P **97** L **33** # 423

Zimmerman, George CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

There is only one PCS reset. This should just reference the earlier requirement

*SuggestedRemedy*

Replace the content of 191.4.2.1 with "See 191.3.2.1."

*Response* *Response Status* **C**

ACCEPT.

Cl **191** SC **191.4.2.2.1** P **99** L **1** # 55

Ran, Adee Cisco Systems

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

The 64B65B coding for LS_PATH seems identical to that of the HS_PATH in 192.3.2.2.1 and subsequent subclauses. If it's different, it would help the reader if the differences were stated instead of repeating everything.

*SuggestedRemedy*

Replace whatever is redundant with references to the parallel content in 191.3.2.2, listing exceptions if they exist.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Editorial license for the editor to add a note where they think the subclauses are identical.

Fix reference in 191.4.2.2.1 to be to 149.4.2.2.4.

Cl **191** SC **191.4.2.2.3** P **99** L **28** # 150

Wienckowski, Natalie IVN Solutions LLC; Ethernovia & Bosch

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

missing article

*SuggestedRemedy*

Change: for ordered set
To: for an ordered set

*Response* *Response Status* **C**

ACCEPT.

Cl **191** SC **191.4.2.2.4** P **99** L **44** # 408

Zimmerman, George CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

The block structure is described in 149.3.2.2.4, but without a 'shall' and hence no requirement. 'shall be as specified' is therefore inappropriate.

*SuggestedRemedy*

Replace "The low data rate block structure shall be as specified in 149.3.2.2.4" with "See 149.3.2.2.4."

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.4.2.2.6** *P* **100** *L* **42** # 403

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

The text of 191.4.2.2.6 refers to 149.3.2.2.6 where there are no requirements, only description of ordered sets used. It should not have a 'shall' here, because it is unclear what requirement is referred to. Additionally, this is an introductory section and should reflect that LPI, used in the refernece, is not used in clause 191 PHYs.

*SuggestedRemedy*

Change "The low data rate ordered sets shall be as specified in 149.3.2.2.6." to "The low data rate ordered set encoding is as in 149.3.2.2.6, except that the LPI ordered set is not used in Clause 191 PHYs."

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.4.2.2.7** *P* **100** *L* **48** # 404

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

This text refers to Idle encoding but says "ordered sets", similarly, 191.4.2.2.8 through 191.4.2.2.11 refer to Start, Terminate, Ordered set, and Error control characters.

*SuggestedRemedy*

Change "ordered sets" to "Idle control character", "Start control character", "Terminate control character", "Ordered set control character", and "Error control character" in 191.4.2.2.7 through .11

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.4.2.2.8** *P* **100** *L* **52** # 425

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

149.3.2.2.9, 149.3.2.2.10, and 149.3.2.2.12 have no requirments. There should not be a shall in the references in 191.4.2.2.8, 191.4.2.2.9 and 191.4.2.2.11 to them

*SuggestedRemedy*

change "shall be as specified" to "are as specified" in 191.4.2.2.8, 191.4.2.2.9, and 191.4.2.2.10

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.4.2.2.12** *P* **102** *L* **7** # 56

Ran, Adee — Cisco Systems

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

Missing space in "(seeFigure 191–18)"

*SuggestedRemedy*

insert space

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.4.2.2.12** *P* **102** *L* **7** # 519

Razavi, Alireza — Eliyan

*Comment Type* **E** *Comment Status* **A** *late - EZ*

Missing space: “(seeFigure 191–18)”.

*SuggestedRemedy*

Insert a space: “(see Figure 191–18)”.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.4.2.2.12** *P* **102** *L* **9** # 497

Razavi, Alireza — Eliyan

*Comment Type* **E** *Comment Status* **A** *late - EZ*

Missing terminal period: the sentence ends “… contain the block payload” with no period.

*SuggestedRemedy*

Add a period at the end of the sentence.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.4.2.2.14** *P* **102** *L* **25** # 151

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

numbers larger than 9 should be written as numbers, not as text per the IEEE Style manual

*SuggestedRemedy*

Change: fifty
To: 50

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.4.2.3** *P* **105** *L* **18** # 46

Muma, Scott — Microchip

*Comment Type* **E** *Comment Status* **A** *EZ - pull*

The sentence "The PCS descrambler employs the generator polynomial per Equation (149–5)." seems to be redundant, out of place, and slightly incorrect at this point

*SuggestedRemedy*

Delete the sentence: The PCS descrambler employs the generator polynomial per Equation (149–5).

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **191** *SC* **191.4.2.3** *P* **105** *L* **18** # 498

Razavi, Alireza — Eliyan

*Comment Type* **E** *Comment Status* **A** *late - EZ - pull*

“employs the generator polynomial per Equation (149–5)” should be replaced by “employs the generator polynomial per Equation (191-8)"

*SuggestedRemedy*

see comment

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by #46.

---

*Cl* **191** *SC* **191.4.4** *P* **106** *L* **1** # 57

Ran, Adee — Cisco Systems

*Comment Type* **T** *Comment Status* **D** *191_PCS_LS*

Equation 191-9 has no indexing of Infofield, OAM, "6bit v-s", Parity - are these constants or scalars that do not need indexing?

*SuggestedRemedy*

Change to Infofield(n-195), OAM(n-260), v-s(n-270), Parity(n-276)

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT.

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*Cl* **191** *SC* **191.4.4** *P* **106** *L* **27** # 277

Jonsson, Ragnar — Infineon

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

The description "The four training frame 65-bit blocks are then concatenated with the 10 OAM bits" is incorrect, as it implies that the 4x65-bits FOLLOW the 10 OAM bits.

*SuggestedRemedy*

Change to "The four training frame 65-bit blocks are followed the 10 OAM bits"

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Correct grammar error in suggested remedy.

Change to "The four training frame 65-bit blocks are followed by the 10 OAM bits"

---

*Cl* **191** *SC* **191.5.2.2** *P* **109** *L* **10** # 9

Ran, Adee — Cisco Systems

*Comment Type* **T** *Comment Status* **A** *191_PMA*

"The PMA Transmit function comprises a transmitter to generate a four-level modulated signal for PAM4, a two-level modulated signal for PAM2, both for HS_TX, and a DME modulated signal for LS_TX "

This reads as if all components are required for a PMA transmit function. But implementations can have either an HS_TX or a LS_TX, not necessarily both, and in the case of HS_TX, it does not necessarily need PAM4.

Also possibly in clause 192.

*SuggestedRemedy*

Rewrite this sentence to make the PMA transmit funciton dependent on the specific PHY type.

Implement in clause 192 if appropriate.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change: The PMA Transmit function comprises a transmitter to generate a four-level modulated signal for PAM4, a two-level modulated signal for PAM2, both for HS_TX, and a DME modulated signal for LS_TX

To: The HS_TX PMA Transmit function comprises a transmitter to generate a two-level PAM2 signal for 2.5 Gb/s and 5 Gb/s and a four-level PAM4 signal for 10Gb/s. The LS_TX PMA Transmit fuction generates a DME modulated signal."

This does not apply to 192.

*Cl* **191** *SC* **191.5.2.2** *P* **109** *L* **15** # 106

Huber, Thomas — Nokia

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

awkward phrase structure: "Auto-Negotation is either not enabled or is not implemented". There shouldn't be an 'is' both before the either and after the or.

*SuggestedRemedy*

Multiple ways this could be fixed:
1. Auto-Negotation either is not enabled or is not implemented
2. Auto-Negotiation is either not enabled or not implemented
3. Auto-Negotiation is neither enabled nor implemented.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change: Auto-Negotation is either not enabled or is not implemented

To: Auto-Negotiation is either not enabled or not implemented

*Cl* **191** *SC* **191.5.2.2** *P* **110** *L* **18** # 514

Razavi, Alireza — Eliyan

*Comment Type* **T** *Comment Status* **R** *late - DME*

Table 191-4 gives DME timing T1 = 8.53 ns and T2 = 4.26 ns. T2 is not exactly half of T1 (T2 should be 4.265 ns if T1 = 8.53 ns, or T1 should be 8.52 ns if T2 = 4.26 ns). The two values disagree at the third decimal place.

*SuggestedRemedy*

Resolve the rounding inconsistency in Table 191-4: either set T1 = 8.533 and T2 = 4.267 (matching 25.6/3 ns), or state explicitly that T2 = T1/2 and give the controlling value, with the dependent value derived in a NOTE.

*Response* *Response Status* **C**

REJECT.

There is a bar over the 3 and 6 so they are exact.

*Cl* **191** *SC* **191.5.2.2** *P* **110** *L* **18** # 516

Razavi, Alireza — Eliyan

*Comment Type* **T** *Comment Status* **D** *late - 191_PHY_Cntrl*

When Auto-Negotiation is bypassed or undefined, neither PHY can identify the remote PHY vendor, so the VendorSpecificData bits (Oct8/9, 191.5.2.4.5) of the HS_PATH Infofield may be interpreted differently by different vendors, creating an interoperability risk.

*SuggestedRemedy*

Move OAMen to octet 7, and use octet 8,9,and 10 for 24 bits OUI
P112, L1 : change Message Field to Message Field and PHY capability bits
P112, L21: bring the definition of OAMen to this line
P112, L22, L33 : convert the first reserved bit to OAMen
P112, L42 : rename section 191.5.2.5.6 to Organizationally Unique Identifier
[Oct8 = OUI[7:0], Oct9 = OUI[15:8], Oct10 = OUI[23:16]] contains Organizationally Unique Identifier (OUI).

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

TFTD

*Cl* **191** *SC* **191.5.2.2.1** *P* **109** *L* **34** # 426

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

DME Encoding is only used by the PHY_D in normal operation. PHY_S, I believe, only uses it in link synchronization. The text gets this all confused and says that the PMA always gets single bits An (which is the wrong variable name) and encodes them as DME (which is also wrong).
The text for DME encoding also has a bunch of extraneous information about tx_mode, which properly belongs in the PMA Transmit section not in a discussion of DME encoding, such as a reference to SEND_Z.

*SuggestedRemedy*

Insert the following at the end of 191.5.2.2:
"When tx_mode is SEND_Z, see 191.7.2.7 for the encoding of "Z".
When tx_mode is not SEND_Z, the PHY_D PMA Transmit function, and the PHY_S PMA Transmit function in link synchronization, shall encode binary values using Differential Manchester Encoding (DME) according to the rules in 191.5.2.2.1.

Delete the first 3 paragraphs of 191.5.2.2.1 (P109 L35 through 42), and change line 44 to read: "The following rules shall apply to when DME encoding is used:"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.5.2.2.1** *P* **109** *L* **36** # 10

Ran, Adee — Cisco Systems

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

The definition of the DME encoder does not mention that it is only used for the LS_PATH (based on 191.1.5).

Also possibly in clause 192.

*SuggestedRemedy*

Clarify that in the text.

Implement in clause 192 if appropriate.

*Response* *Response Status* **C**

REJECT.

DME is used by both transmitters during training. 192 does not use DME.

*Cl* **191** *SC* **191.5.2.3** *P* **110** *L* **40** # 152

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

Polarity swaps are not limited to the balanced pair, there is a desire to correct for the signal and ground to be swapped.

*SuggestedRemedy*

Change: correct for pair ploarity swaps.
To: correct for polarity swaps.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.5.2.4** *P* **110** *L* **50** # 427

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

The 'shall' requirement for Figure 191-31 is repeated multiple times. We must really think someone is going to skip it! We only need to state the requirement once - in the section for both HS and LS path. It isn't like someone is going to start up one path and not the others.

*SuggestedRemedy*

change "shall comply with the state diagram in Figure 191-31" to "is shown in the state diagram in Figure 191-31 (see 191.5.2.6)." in 1st paragraph of 191.5.2.4 (P110 L50) and in the first paragraph of 191.5.2.5 (P114 L25).
(leave the requirement as is in the first sentence of 191.5.2.6 on P116 L15)

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.5.2.4** *P* **111** *L* **2** # 153

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

*Comment Type* **E** *Comment Status* **D** *191_PMA*

There is not always a PAM2 to PAM4 transition when completing training,

*SuggestedRemedy*

Change: PAM2 to PAM4 transition.
To: PCS_TEST to PCS_DATA transition.

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT.

*Cl* **191** *SC* **191.5.2.4.4** *P* **112** *L* **4** # 500

Razavi, Alireza — Eliyan

*Comment Type* **E** *Comment Status* **A** *late - 191_PHY_Cntrl*

The Message Field uses the bit timing_lock_OK for the FOLLOWER (Oct7<4>), but timing_lock_OK is not defined as a state diagram variable in 191.5.2.6.1 and does not appear in the PHY Control state diagram (Figure 191–31) .

*SuggestedRemedy*

timing_lock_OK bit does not carry any information. replace timing_lock_OK bit with a reserved bit

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Insert text in 191.5.2.6 (page 116) after line 28.

The follower sets timing_lock_OK to one when it has stable transmit clock, and otherwise timing_lock_OK is set to zero. The setting of timing_lock_OK value is implementation specific.

*Cl* **191** *SC* **191.5.2.4.5** *P* **112** *L* **43** # 494

Cheng, Xiaoyue — Infineon

*Comment Type* **E** *Comment Status* **A** *191_Infofields*

"The format of PHY capability bits is Oct10<2:1> = InterleaverDepth[1:0], Oct10<4:3> = PrecodeSel[1:0],
Oct10<7> = OAMen, Oct8<7:0> = VendorSpecificData[7:0], and Oct9<7:0> = VendorSpecificData[15:8].
OAMen indicates MultiGBASE-T1 OAM capability is enabled.
The optional MultiGBASE-T1 OAM capability..."

For HS_PATH, there is no Interleave or Precode. Also, better to change the speed description into consistent format with 191.5.2.5.4 in LS_PATH

*SuggestedRemedy*

change into:
"The format of PHY capability bits is Oct10<7> = OAMen, Oct8<7:0> = VendorSpecificData[7:0], and Oct9<7:0> = VendorSpecificData[15:8].
OAMen indicates MultiG+100MBASE-T1/V1 OAM capability is enabled.
The optional MultiG+100MBASE-T1/V1 OAM capability…"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.5.2.4.5** *P* **112** *L* **51** # 374

Lasry, Ariel — Qualcomm Technologies, Inc.

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

Need to use appropriate PHY name

*SuggestedRemedy*

Replace "MultiGBASE-T1" with "MultiG+100MBASE-T1/V1, 100M+MultiGBASE-T1/V1"

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Replace "MultiGBASE-T1" with "MultiG+100MBASE-T1/V1"

*Cl* **191** *SC* **191.5.2.4.5** *P* **112** *L* **53** # 375

Lasry, Ariel — Qualcomm Technologies, Inc.

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

Need to use appropriate PHY name

*SuggestedRemedy*

Replace "MultiGBASE-T1" with "MultiG+100MBASE-T1/V1, 100M+MultiGBASE-T1/V1"

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Replace "MultiGBASE-T1" with "MultiG+100MBASE-T1/V1"

*Cl* **191** *SC* **191.5.2.4.5** *P* **112** *L* **54** # 376

Lasry, Ariel — Qualcomm Technologies, Inc.

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

Add a new sentence to this line. "InterleaverDepth indicates the requested data mode interleaving depth. PrecodeSel indicates the requested precoder, available for 10G only."

*SuggestedRemedy*

See comment

*Response* *Response Status* **W**

ACCEPT.

*Cl* **191** *SC* **191.5.2.4.5** *P* **113** *L* **1** # 368

Lasry, Ariel — Qualcomm Technologies, Inc.

*Comment Type* **TR** *Comment Status* **A** *191_Infofields*

Table 191-7 should show the fields described on lines 48, 49 of page 112.
It seems that the content of this table should be swapped with the content of Table 191-10.

*SuggestedRemedy*

Replace Table-191-7 with the content of Table 191-10 and add ",HS_PATH" to the table title

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change the title of Table 191-7 to:
PHY capability bits, HS_PATH

Change title of 191.4.2.4.5 to:
PHY capability bits, HS_PATH

Add as a new first sentence in 191.5.2.4.5
The capability bits set in PHY_S are sent to PHY_D over the HS_PATH.

*Cl* **191** *SC* **191.5.2.4.5** *P* **113** *L* **12** # 112

Lo, Willliam — Axonne Inc.

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

Various capabilities are defined but not mapped to a register.

*SuggestedRemedy*

The OAMen is advertised in bit 1.2311.1.
The advertised status is reported in bit 1.2312.1 of the link partner.

The VendorSpecificData to send is set via bits 1.2316:15:0 and received on the link partner bits 1.2317:15:0.

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

P112L51

Change: OAMen indicates MultiGBASE-T1 OAM capability is enabled.

To: OAMen indicates MultiGBASE-T1 OAM capability is enabled. The OAMen is advertised in bit 1.2311.1. (See 45.2.1.244.5 for the definition of bit 1.23.11.1.) The link partner's OAMen is advertised in bit 1.2312.1. (See 45.2.1.245.4 for the definition of bit 1.23.12.1.)

P112L54 add new paragraph:

The VendorSpecificData the PHY sends to its link parter are bits 1.2316:15:0 (see 45.2.1.249). The VendorSpecificData received from the link partner are bits 1.2317:15:0 (see 45.2.1.250).

---

*Cl* **191** *SC* **191.5.2.4.5** *P* **113** *L* **15** # 428

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

The requirment here can be read to duplicate the requirement in 191.5.2.4.1 that requires reserved bits set to zero. It is rewritten to still require the bits be reserved, but reference 191.5.2.4.1. (also, 0 is changed to zero to comply with style)

*SuggestedRemedy*

Change "The remaining bits shall be reserved and set to 0." to "The remaining bits shall be reserved and are set to zero per 191.5.2.4.1."

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **191** *SC* **191.5.2.4.7** *P* **113** *L* **28** # 292

van Dyck, Peter — Infineon

*Comment Type* **E** *Comment Status* **D** *EZ - pull*

"149.4.2.4.7 Reserved fields" section is missing in Clause 191.

*SuggestedRemedy*

Move 191.5.2.4.8 to 191.5.2.4.9, move 191.5.2.4.7 to 191.5.2.4.8, add new section 191.5.2.4.7 with the text from 149.4.2.4.7

*Proposed Response* *Response Status* **Z**

PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

---

*Cl* **191** *SC* **191.5.2.4.8** *P* **113** *L* **50** # 512

Razavi, Alireza — Eliyan

*Comment Type* **E** *Comment Status* **A** *late - EZ*

PMA MDIO function mapping identical for both high and low speed direction

*SuggestedRemedy*

move 191.5.2.4.8 to new section 191.5.2.6.4 and remove 191.5.2.5.6

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **191** *SC* **191.5.2.4.8** *P* **114** *L* **19** # 513

Razavi, Alireza — Eliyan

*Comment Type* **T** *Comment Status* **A** *late - 191_faults*

Table 191-9 maps “Receive fault” → PMA_receive_fault, but PMA_receive_fault is not defined in 191.5.2.x variable lists; the variable appears only in this mapping table. PMA_transmit_disable needs definition too

*SuggestedRemedy*

use lower case for PMA in PMA_transmit_disable, and add the definition to p118, L32 pma_transmit_disable : When pma_transmit_disable set to TRUE, the average power of transmitted signal at MDI is nominally zero, and the transmitted signal shall be less than -36 dBm. use lower case for PMA in PMA_receive_fault, and add the definition to p118, L32 pma_receive_fault When pma_receive_fault set to TRUE, it indicates that training in phy control state machine is not successful.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Remove row Transmit disable from Table 191-8.

Remove row Receive fault from Table 191-9.

*Cl* **191** *SC* **191.5.2.4.8** *P* **114** *L* **20** # 111

Lo, Willliam — Axonne Inc.

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

link_status defined but not listed in table 191-9.

*SuggestedRemedy*

Add to table 191-9
Link Status , MultiGBASE-T1/V1 PMA status register, 1.2310.0, link_status

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Add row to the end of table 191-9.

Link Status | MultiGBASE-T1/V1 PMA status register | 1.2310.0 | link_status

*Cl* **191** *SC* **191.5.2.5** *P* **114** *L* **33** # 291

van Dyck, Peter — Infineon

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

The 65-bit Infofield does not include the PMA MDIO function mapping

*SuggestedRemedy*

Replace:
191.5.2.5.2 through 191.5.2.5.6

With:
191.5.2.5.2 through 191.5.2.5.5

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.5.2.5** *P* **114** *L* **39** # 515

Razavi, Alireza — Eliyan

*Comment Type* **T** *Comment Status* **D** *late - 191_PHY_Cntrl*

When Auto-Negotiation is bypassed or undefined, neither PHY can identify the remote PHY vendor, so the VendorSpecificData bits (Oct6/7, 191.5.2.5.4) of the LS_PATH Infofield may be interpreted differently by different vendors, creating an interoperability risk.

*SuggestedRemedy*

Redefine Oct2/3/4 of the LS_PATH Infofield as a 24-bit Organizationally Unique Identifier (OUI):
P114, L 30 : replace “reserved “ with Organizationally Unique Identifier
P116,L 3 : rename section 191.5.2.5.6 with Organizationally Unique Identifier
[Oct2 = OUI[7:0], Oct3 = OUI[15:8], Oct4 = OUI[23:16]] contains Organizationally Unique Identifier (OUI). The OUI is a 24-bit organization identifier assigned by the IEEE Registration Authority.

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

TFTD

*Cl* **191** *SC* **191.5.2.5.1** *P* **114** *L* # 429

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

*Comment Type* **E** *Comment Status* **A** *191_Infofields*

Since infofield notation is the same for both, don't repeat it. It could get changed and be confusing….

*SuggestedRemedy*

Replace content of 191.5.2.5.1 with "See 191.5.2.4.1."

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.5.2.5.3** *P* **115** *L* **16** # 278

Jonsson, Ragnar — Infineon

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

The statement "Any other value shall not
be transmitted and shall be ignored at the receiver" is ambigous.

*SuggestedRemedy*

Change to "Any value not listed in Table 191–5 for the LEADER and Table 191–6 for the FOLLOWER shall not be transmitted and shall be ignored at the receiver"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.5.2.5.4** *P* **115** *L* **30** # 369

Lasry, Ariel — Qualcomm Technologies, Inc.

*Comment Type* **TR** *Comment Status* **A** *191_Infofields*

Table 191-10 has fields for InterleaverDepth and PrecodeSel. However, there is no FEC interleaving and no PreCoder on the LS_PATH.

*SuggestedRemedy*

Table 191-10: bits 1,2,3 and 4 should be changed to Reserved.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change title of 191.4.2.5.4 to:
PHY capability bits, LS_PATH

Add as a new first sentence in 191.5.2.5.4
The capability bits set in PHY_D are sent to PHY_S over the LS_PATH to control the transmitter settings on the HS_PATH.

---

*Cl* **191** *SC* **191.5.2.5.4** *P* **115** *L* **44** # 370

Lasry, Ariel — Qualcomm Technologies, Inc.

*Comment Type* **TR** *Comment Status* **R** *191_Infofields*

Delete "Oct8<2:1> = InterleaverDepth[1:0], Oct8<4:3> = PrecodeSel[1:0]," as there is no FEC interleaving and no precoder on the LS_PATH

*SuggestedRemedy*

See comment

*Response* *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

---

*Cl* **191** *SC* **191.5.2.5.4** *P* **115** *L* **47** # 371

Lasry, Ariel — Qualcomm Technologies, Inc.

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

this line applies also to MultiG+100MBASE-T1/V1

*SuggestedRemedy*

Add ", MultiG+100MBASE-T1/V1" before "OAM"

*Response* *Response Status* **W**

REJECT.

See 191.5.2.4.5 for the MultiG+100MBASE-T1/V1 OAM requirement.

See #374 which corrects the text in 191.5.2.4.5.

---

*Cl* **191** *SC* **191.5.2.5.4** *P* **115** *L* **49** # 372

Lasry, Ariel — Qualcomm Technologies, Inc.

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

this line applies also to MultiG+100MBASE-T1/V1

*SuggestedRemedy*

Add ", MultiG+100MBASE-T1/V1" before "OAM"

*Response* *Response Status* **W**

REJECT.

See 191.5.2.4.5 for the MultiG+100MBASE-T1/V1 OAM requirement.

See #375 which corrects the text in 191.5.2.4.5.

---

*Cl* **191** *SC* **191.5.2.5.4** *P* **115** *L* **50** # 373

Lasry, Ariel — Qualcomm Technologies, Inc.

*Comment Type* **TR** *Comment Status* **R** *191_Infofields*

Remove the sentence "InterleaverDepth indicates the requested data mode interleaving depth. PrecodeSel indicates the requested precoder, available for 10G only." As there is no 10G on the LS_PATH

*SuggestedRemedy*

see comment

*Response* *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **191** *SC* **191.5.2.5.4** *P* **115** *L* **52** # 113

Lo, Willliam — Axonne Inc.

*Comment Type* **TR** *Comment Status* **A** *EZ - pull*

Various capabilities are defined but not mapped to a register.

*SuggestedRemedy*

The InterleaverDepth request is set in bits 1.2311.12:11.
The received InterleaverDepth request is reported in bit 1.2312.12:11 of the link partner.

When bit 1.2311.5 is set to 1, the PrecodeSel request is set in bits 1.2311.3:2, otherwise the PHY determines the precoder setting. The actual setting transmitted is reflected in bit 1.2310.4:3.
The received PrecodeSel request is reported in bit 1.2312.3:2 of the link partner

The OAMen is advertised in bit 1.2311.1.
The advertised status is reported in bit 1.2312.1 of the link partner.

The VendorSpecificData to send is set via bits 1.2316:15:0 and received on the link partner bits 1.2317:15:0.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add new paragraphs on P115L47

Editorial license to improve wording.

The InterleaverDepth request the PHY sends to its link partner is bits 1.2311:12:11 (see 45.2.1.244.1). The InterleaverDepth requested by the link partner is bits 1.2312:12:11 (see 45.2.1.245.1).

When bit 1.2311.5 (see 45.2.1.244.2) is set to one, the PrecodeSel request is set in bits 1.2311.3:2 (see 45.2.1.244.4); otherwise, the PHY determines the precoder setting. The actual setting transmitted is reflected in bit 1.2310.4:3 (see 45.2.1.243.5).

The received PrecodeSel request is reported in bit 1.2312.3:2 (see 45.2.1.245.3) by the link partner.

In 45.2.1.244.3 Change: specified in 149.4.2.4.5.
To: specified in 149.4.2.4.5 and 191.5.2.5.4.

In 45.2.1.244.4 Change: (see 149.4.2.4.5)
To: (see 149.4.2.4.5 and 191.5.2.5.4)

*Cl* **191** *SC* **191.5.2.5.4** *P* **116** *L* **1** # 430

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

The requirment here can be read to duplicate the requirement in 191.5.2.5.1 that requires reserved bits set to zero. It is rewritten to still require the bits be reserved, but reference 191.5.2.5.1. (also, 0 is changed to zero to comply with style)

*SuggestedRemedy*

Replace "The remaining PHY capability bits shall be reserved and set to 0." with "The remaining PHY capability bits shall be reserved and are set to zero per 191.5.2.5.1."

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.5.2.5.5** *P* **116** *L* **5** # 431

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

The standard simply reserves - it is inappropriate to talk about future use. When a future use is standardized, the standard will be amended to unreserve the bits… these are just reserved bits.

*SuggestedRemedy*

change "contains a reserved field and are reserved for future use." to "are reserved and are set to zero per 191.5.2.5.1."

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.5.2.5.5** *P* **116** *L* **5** # 293

van Dyck, Peter — Infineon

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

Clear definition of reserved fields missing.

*SuggestedRemedy*

Append after "for future use."
"Reserved bits shall be set to 0."

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Append after "for future use."
"Reserved bits shall be set to zero."

*Cl* **191** *SC* **191.5.2.6** *P* **116** *L* **21** # 107

Huber, Thomas — Nokia

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

awkward phrase structure: "Auto-Negotation is either not enabled or is not implemented". There shouldn't be an 'is' both before the either and after the or.

*SuggestedRemedy*

Multiple ways this could be fixed:
1. Auto-Negotation either is not enabled or is not implemented
2. Auto-Negotiation is either not enabled or not implemented
3. Auto-Negotiation is neither enabled nor implemented.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change: Auto-Negotation is either not enabled or is not implemented

To: Auto-Negotiation is either not enabled or not implemented

*Cl* **191** *SC* **191.5.2.6** *P* **116** *L* **29** # 432

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

*Comment Type* **T** *Comment Status* **R** *191_PHY_Cntrl*

It appears that Table 191-11 is simply informational, and is a consequence of the PHY control state diagram. If so, it should not have a shall.

*SuggestedRemedy*

Consider wheter Tables 191-11 and 191-12 have requirements or are simply informational. If they have requirments,incorporate them into the PHY control state diagram. If not, change"shall comply with" to "is shown in" at P116 L29

*Response* *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **191** *SC* **191.5.2.6** *P* **116** *L* **38** # 47

Muma, Scott — Microchip

*Comment Type* **E** *Comment Status* **R** *EZ - pull*

The literal number would be more clear than an equation in this table

*SuggestedRemedy*

Change 20 - 0.384 to 19.616

*Response* *Response Status* **C**

REJECT.

This is written this way to show the values that are involved in this calculation as depicted in the table.

*Cl* **191** *SC* **191.5.2.6** *P* **117** *L* **6** # 48

Muma, Scott — Microchip

*Comment Type* **E** *Comment Status* **R** *EZ - pull*

The literal number would be more clear than an equation in this table

*SuggestedRemedy*

Change 20 - 0.384 to 19.616

*Response* *Response Status* **C**

REJECT.

This is written this way to show the values that are involved in this calculation as depicted in the table.

*Cl* **191** *SC* **191.5.2.6.1** *P* **118** *L* **20** # 460

Law, David HPE

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

Subclause 191.5.2.6.1 'State diagram variables' defines the pcs_data_mode variable as 'Generated by the PMA PHY Control function and indicates ... passed to the PCS via the PMA_PCSDATAMODE.indication primitive.' without defining the variable values.

*SuggestedRemedy*

Add the following to the definition of the pcs_data_mode variable in subclause 191.5.2.6.1.

Values:
TRUE The PCS is transmitting and receiving data from the XGMII.
FALSE The PCS is in a training or test mode.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Pcs_data_mode is first defined in 191.3.5.1.2.

Add this text on P88L45.

P118L21, Replace the definition with:
This variable is defined in 191.3.5.1.2.

*Cl* **191** *SC* **191.5.2.6.1** *P* **118** *L* **48** # 279

Jonsson, Ragnar Infineon

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

The PHY_D and PHY_S transition out of TRAINING at slightly different times due to the PHY_S mandatory countdown phase. When the PHY_D exits TRAINING and enters PCS_TEST (and subsequently PCS_DATA), it stops sending Infofield messages. Because the PHY_S is still in TRAINING, it checks for rem_rcvr_status = OK from the partner. If the receiver status is not latched once received, the PHY_S will clear rem_rcvr_status and hang in training.

*SuggestedRemedy*

Add the following after the text in line 49 on page 118: "The parameter rem_rcvr_status shall be set to the value received in the loc_rcvr_status bit in the Infofield from the remote PHY. The rem_rcvr_status is set to NOT_OK if the PCS has not decoded a valid Infofield from the remote PHY. The rem_rcvr_status is set to OK when remote PHY is transmitting SEND_N."

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement the suggested remedy and update PICS as needed.

*Cl* **191** *SC* **191.5.2.6.1** *P* **119** *L* **6** # 154

Wienckowski, Natalie IVN Solutions LLC; Ethernovia & Bosch

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

Add true and false definitions

*SuggestedRemedy*

TRUE: Training has not been successfully completed.
FALSE: Training has been successfully completed.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by #460.

*Cl* **191** *SC* **191.5.2.6.2** *P* **119** *L* **19** # 202

Wienckowski, Natalie IVN Solutions LLC; Ethernovia & Bosch

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

Removed redundant statement. This is already stated in 191.1.7.

*SuggestedRemedy*

Delete: All timers operate in the manner described in 14.2.3.2.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.5.2.6.2** *P* **119** *L* **24** # 433

Zimmerman, George CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

duplicate shall. The timer's behavior is required by the shall on the state diagram.

*SuggestedRemedy*

change "shall expire" to "expires" at P119 L24

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.5.2.6.3** *P* **120** *L* **7** # 461

Law, David HPE

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

The mr_autoneg_enable variable is used as part of the open arrow entry condition to the DISABLE_TRANSMITTER state in Figure 191–31—PHY 'Control state diagram', as well as in the transition condition from the DISABLE_TRANSMITTER state to the SILENT state. The mr_autoneg_enable variable, however, is not defined in the associated subclause 191.5.2.6.1 'State diagram variables'.

*SuggestedRemedy*

Add the following to subclause 191.5.2.6.1:

mr_autoneg_enable
see 98.5.1.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.5.2.6.3** *P* **120** *L* **47** # 462

Law, David HPE

*Comment Type* **TR** *Comment Status* **A** *191_PHY_Cntrl*

Figure 191–31 'PHY Control state diagram' in the PMA uses the hi_rfer and block_lock variables, yet these variables are not defined in subclause 191.5.2.6.1 'State diagram variables'. The hi_rfer and block_lock variables are generated in the PCS, with the hi_rfer variable generated in Figure 191–17 'RFER monitor state diagram', and the block_lock generated in subclause 191.4.2.3 PCS 'Receive function'. As a result, these variables pass across the PMA Service interface, yet they are not parameters of any of the primitives defined in subclause 191.2.2 'PMA service interface'. Further, they are not illustrated in Figure 191–3 'PHY_S functional block diagram', Figure 191–4 'PHY_D functional block diagram', Figure 191–7 'PHY_S 'PCS reference diagram', Figure 191–8 'PHY_D PCS reference diagram', and Figure 191–25 'PMA reference diagram'.

*SuggestedRemedy*

[1] Add the following to the list of primitives in subclause 191.2.2 'PMA service interface':

PMA_PCSSYNC.request(block_lock, rfer_cnt)

[2] Add an arrow labelled 'PMA_PCSSYNC.request' from the PHY_S PCS to PHY_S PMA block in Figure 191–5 'PHY_S service interfaces' in Figure 191–5 'PHY_S service interfaces' and Figure 191–6 'PHY_D service interfaces'.

[3] Add the following new subclauses to subclause 191.2.2:

191.2.2.X PMA_PCSSYNC.request

191.2.2.X.1 Semantics of the primitive

PMA_PCSSYNC.request(block_lock, rfer_cnt)

The PMA_PCSSYNC.request primitive passes the block_lock and rfer_cnt parameters from the PCS to the PMA.

The parameter block_lock can take on one of the following two values of the form:

TRUE The PCS Synchronization process has acquired block delineation.
FALSE The PCS Synchronization process has not acquired block delineation.

The parameter rfer_cnt can take on one of the following two values of the form:

TRUE The PCS Synchronization has detected 16 errors in one RFRX_CNT_LIMIT interval.
FALSE The PCS Synchronization has not detected 16 errors in one RFRX_CNT_LIMIT interval.

191.2.2.X.2 When generated

The PCS generates PMA_PCSSYNC.request messages to indicate a change in block_lock

or rfer_cnt.

191.2.2.X.3 Effect of receipt

The effect of receipt of this primitive is specified in Figure 191–31.

[4] Add block_lock and rfer_cnt to figures 191–3, 191–4, 191–7, 191–8 and 191–25.

[5] Add the following variables to subclause 191.5.2.6.1 'State diagram variables':

block_lock

Boolean variable that is set TRUE by the PCS Synchronization process when it acquires block delineation. It is passed to the PMA via the block_lock parameter of the PMA_PCSSYNC.request primitive.

hi_rfer
Boolean variable that is set TRUE by the PCS Synchronization process when the rfer_cnt reaches 16 errors in one RFRX_CNT_LIMIT interval. It is passed to the PMA via the rfer_cnt parameter of the PMA_PCSSYNC.request primitive.

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Implement suggested changes with editorial license to align with other changes.

Maintenance requests may be needed for 149 and 165 as they have the same issue.

---

*Cl* **191** *SC* **191.5.2.8** *P* **122** *L* **3** # 58

Ran, Adee Cisco Systems

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

"Clause 98" should be an active cross reference.

*SuggestedRemedy*

Make it an active xref.

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **191** *SC* **191.5.2.8** *P* **122** *L* **23** # 108

Huber, Thomas Nokia

*Comment Type* **T** *Comment Status* **A** *191_link_sync*

Figure 191-33 is not entirely clear. The text at the bottom right "LEADER stops…" doesn't seem to align with the period of time that the brace to which the text relates indicates, since the Leader is still transmitting.. Maybe the "LEADER stops…" and "FOLLOWER mimics…" labels got transposed (and if so, maybe the line from "FOLLOWER mimics..." really should be pointing to the last block in the LEADER row)?

*SuggestedRemedy*

Revise the figure to better illustrate the intended behavior. As the comment notes, one option would be to switch the "LEADER stops…" and "FOLLOWER mimics…" labels, and change the line that would say "LEADER stops…" to point to the last block in the LEADER row rather than the last block in the FOLLOWER row.

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **191** *SC* **191.5.2.8.1** *P* **123** *L* **43** # 463

Law, David HPE

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

Typo.

*SuggestedRemedy*

'mr_autoneg_enable:' should read 'mr_autoneg_enable' (remove colon).

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **191** *SC* **191.5.2.8.1** *P* **123** *L* **45** # 59

Ran, Adee Cisco Systems

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

"98.5.1" is formatted as external reference but exists in the draft. Also in line 48.

*SuggestedRemedy*

Make it an active xref (twice).

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.5.2.8.1** *P* **124** *L* **4** # 280

Jonsson, Ragnar Infineon

*Comment Type* **TR** *Comment Status* **A** *191_link_sync*

Incorrect condition for FALSE state

*SuggestedRemedy*

Change "At least one SEND_S pulse" to "At least three SEND_S pulses".

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change the definitions of True and False for quiet_detect to:

TRUE: No more than two SEND_S pulses have been detected at the specified times (for LEADER or FOLLOWER see Figure 191–34) within the preceding 5.1 µsec.

FALSE: At least three SEND_S pulse has been detected at the specified times (for LEADER or FOLLOWER see Figure 191–34) within the preceding 5.1 µsec.

*Cl* **191** *SC* **191.5.2.8.2** *P* **124** *L* **44** # 381

Maguire, Valerie Copperopolis; aff'l w/ CME Consulting, Microchip, and

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

"will be" seems to imply something in the future and I don't think this is what's intended.

*SuggestedRemedy*

Change "will be" to "is"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.5.2.8.2** *P* **124** *L* **46** # 434

Zimmerman, George CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

duplicate shall. The timer's behavior is required by the shall on the state diagram.

*SuggestedRemedy*

change "shall expire" to "expires" for fail_inhibit_timer and sigdet_wait_timer (P124 L46 and L54)

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.5.2.8.4** *P* **126** *L* **12** # 241

McCarthy, Frank Infineon

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

There are two SEND_REPLY states in Figure 191–35—PHY Link Synchronization state diagram. The SEND_REPLY state name is a little confusing especially for the LEADER. If the name were changed to SEND_PULSE, then the name would be more informative.

*SuggestedRemedy*

Change the name of the SEND_REPLY state to SEND_PULSE.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by #464.

*Cl* **191** *SC* **191.5.2.8.4** *P* **126** *L* **12** # 464

Law, David HPE

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

Figure 191–35 'PHY Link Synchronization state diagram' has two states named 'SEND_REPLY'.

*SuggestedRemedy*

[1] Change the 'SEND_REPLY' state on the left-hand side to 'FOLLOWER_SEND_REPLY'.
[2] Change the 'SEND_REPLY' state on the right-hand side to 'LEADER_SEND_REPLY'.

*Response* *Response Status* **W**

ACCEPT.

*Cl* **191** *SC* **191.5.2.8.4** *P* **126** *L* **42** # 465

Law, David HPE

*Comment Type* **T** *Comment Status* **A** *191_link_sync*

Figure 191–35 'PHY Link Synchronization state diagram' uses the training_failure variable in the transition from the LINK_GOOD_CHECK state to the TRANSMIT_DISABLE state. However, the training_failure variable is not defined in subclause 191.5.2.8.1 'State diagram variables'.

*SuggestedRemedy*

Add the following to subclause 191.5.2.8.1:

training_failure
A Boolean variable indicating whether PHY Control has resulted in a successful training.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

This is defined in 191.5.2.6.1.

On P124L26
Add: training_failure:
see 191.5.2.6.1.

*Cl* **191** *SC* **191.5.2.10** *P* **127** *L* **14** # 155

Wienckowski, Natalie IVN Solutions LLC; Ethernovia & Bosch

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

Remove unnecessary text

*SuggestedRemedy*

Delete sentence in 191.5.2.10

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.5.2.11** *P* **128** *L* **3** # 435

Zimmerman, George CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

The requirement in 191.5.2.10.1 needs to be inferred given the way this is written. It would be clearer to call it out since the text just says "as described", and just copy down the text from 191.5.2.10.1

*SuggestedRemedy*

Insert at the end of 191.5.2.11 (P128 L2) "The symbol response shall comply with the electrical specifications given in 191.6.2 for the HS_TX path
and 191.7.2 for the LS_TX path."

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.5.6.1** *P* **128** *L* **47** # 436

Zimmerman, George CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

*Comment Type* **E** *Comment Status* **A** *191_tests*

The text says Test mode 2 transmits JP03A or JP03B, we need to know which one is transmitted. That doesn't appear until several pages later, and leads to confusion. (Table 191-15).

*SuggestedRemedy*

Consider whether a separate test mode is needed for each pattern or else add text indicating how the pattern is selected. If it is implementer's choice, add, "See Table 191-15 for control of jitter test modes." after "from its local clock source." (before discussion of PAM2 at P128 L48)

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

add, "See Table 191-15 for control of jitter test modes." after "from its local clock source." (before discussion of PAM2 at P128 L48)

*Cl* **191** *SC* **191.5.6.1** *P* **128** *L* **51** # 437

Zimmerman, George CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

Test mode 3 is valid only for PAM4 (10 G operation). Otherwise, {0,3} (and the precoder) are invalid to the PMA

*SuggestedRemedy*

Change the first sentence of the 5th paragraph of 191.6.1 (P128 L51) to read "Test mode 3 is specified for 10G+100MBASE-T1/V1 PHYs only, and is for testing precoder operation."

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.6.1** *P* **128** *L* **29** # 387

Maguire, Valerie — Copperopolis; aff'l w/ CME Consulting, Microchip, and

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

Per guidance from Pete Anslow provided during P802.3dg pre-publication review, “FOLLOWER” should be “Follower” and “LEADER” should be “Leader” when referring to the operating mode of the PHY.

*SuggestedRemedy*

Grant Editors license to change “FOLLOWER” to “Follower” and “LEADER” to “Leader” when referring to the operating mode of the PHY.

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **191** *SC* **191.6.1** *P* **128** *L* **51** # 114

Lo, Willliam — Axonne Inc.

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

Clarify that test mode 3 applies only to PAM4.

*SuggestedRemedy*

Insert to the end of the following sentence:
"Test mode 3 is for testing the precoder operation" add:
"in MultiG+100MBASE-T1/V1 only."

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by #437.

---

*Cl* **191** *SC* **191.6.2** *P* **131** *L* **50** # 438

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

No need for the repeated "shall" in the expanatory "i.e.," phrase for what AC-coupling means… it looks like 2 requirements

*SuggestedRemedy*

change "i.e., it shall present" to "i.e., it presents" at P131 L50

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **191** *SC* **191.6.2** *P* **131** *L* **51** # 335

Wang, Frank — Realtek Semiconductor Corp.

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

to align with 802.3ch

*SuggestedRemedy*

change "dc" to "DC"

*Response* *Response Status* **C**

REJECT.

Per guidance from Pete Anslow, ac and dc correct. "AC" and "DC" should only be used when the acronym is the start of the sentence.

---

*Cl* **191** *SC* **191.6.2.1** *P* **132** *L* **37** # 439

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

"jitter shall be measured" is a requirement on the user, not appropriate. This same text shows up in 191.6.2.2, 191.7.2.1, and 191.7.2.2 (I think 192 is clean). If changed it should be done everywhere.

*SuggestedRemedy*

change "shall be measured" to "is defined when measured" in 191.6.2.1, 191.6.2.2, 191.7.2.1, and 191.7.2.2

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **191** *SC* **191.6.2.1** *P* **132** *L* **38** # 440

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

"capturing device shall be at least 200 MHz" is a requirement on the user. This same text shows up in 191.6.2.2, 191.7.2.1, and 191.7.2.2 (I think 192 is clean). If changed it should be done everywhere.

*SuggestedRemedy*

change "The band-pass bandwidth of the capturing device shall be at least 200 MHz" to "Conformance to this specification is defined when a capturing device with at least 200 MHz band-pass bandwidth is used."in 191.6.2.1, 191.6.2.2, 191.7.2.1, and 191.7.2.2

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.6.2.4** *P* **133** *L* **32** # 441

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

*Comment Type* **T** *Comment Status* **A** *191_tests*

A rate of 5625xS MHz would only apply to PHY_S transmitting, and 5625/48 MHz for a PHY_D transmitting, yet this spec is divided on leader and follower…

*SuggestedRemedy*

Change the frequency for the follower PHY from 5625/48 MHz +1/-20%" to "5625 x S MHz +/- 100 ppm. See Table 191-1 for definition of S."

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

P133L37

Change: 5625 / 48

To: 5625 x S

*Cl* **191** *SC* **191.6.2.4** *P* **133** *L* **35** # 11

Ran, Adee — Cisco Systems

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

The clock frequency is defined with dependence on LEADER/FOLLOWER, and FOLLOWER has a single frequency of 5625/48 MHz. but it seems that this frequency should only be used for LS_TX regardless of LEADER/FOLLOWER roles.

Note that in 191.7.2.4 (which is under the LS_PATH) the nominal symbol rate is also 5625/48 MHz.

Also possibly in clause 192.

*SuggestedRemedy*

Change to define the frequencies for HS_TX regardless of LEADER/FOLLOWER, and state that it is for the HS_TX. In 191.7.2.4 state that it is for the LS_TX.

Implement in clause 192 if appropriate.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by #441.

Does not apply to 192.

*Cl* **191** *SC* **191.6.2.4** *P* **133** *L* **37** # 442

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

The short term frequency variation should apply to both leader & follower, PHY_S and PHY_D, yet is written so it only applies to a PHY_D as follower. Frankly, a follower can't really control its short term variation….

*SuggestedRemedy*

Change the last sentence of the 2nd paragraph in 191.6.2.4 as follows:
delete "and the short-term… 1%/second" (ending the sentence after +1/-20%) at P133 L37
Create new 3rd paragraph: "For both PHY_S and PHY_D, leader and follower, the short-term rate of frequency variation shall be less than 1% / second."

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.6.2.5** *P* **133** *L* **41** # 443

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

Requiring a test to be performed is a requirement on the user - we required the device to pass the test - those requirements are already there in the paragraph.

*SuggestedRemedy*

Change the first sentence of 191.6.2.5 from "With the transmitter in test mode 4, transmitting in MultiG mode, and using the transmitter test fixture 1 shown in Figure 191–36 for -T1 and Figure 191–37 for -V1, the test defined in 120D.3.1.2 shall be performed."
to: "Transmitter linearity is specified with the transmitter in test mode 4, transmitting in MultiG mode, and using the transmitter test fixture 1
shown in Figure 191–36 for -T1 and Figure 191–37 for -V1, according to the test definition in 120D.3.1.2."

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.6.2.5** *P* **133** *L* **42** # 295

Sakunia, Saket — Infineon

*Comment Type* **T** *Comment Status* **D** *191_tests*

802.3dm PSD mask allows for a a low-frequency high-pass filtering that produces baseline wander outside the usual impulse-response window. Without compensation, this baseline energy is counted as distortion/noise, depressing SNDR and degrading inter-lab correlation. The proposed subclause adds a narrowly scoped, LTI compensation step in Clause 201—without modifying 120D.3.1.2—restoring accuracy and repeatability while preserving test modes, fixtures, and limits.

*SuggestedRemedy*

With the transmitter in test mode 4, transmitting in MultiG mode, and using the transmitter test fixture 1
shown in Figure 191–36 for -T1 and Figure 191–37 for -V1, the test defined in 120D.3.1.2 shall be
performed. "Annex191B describes additional High Pass Filter to be applied to the measured data when the DUT includes any low frequency high pass filtering (e.g. PoC/PoDL)"

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Add additional text shown in "" in suggested remedy.

Add Normative Annex 191 B shown in
https://www.ieee802.org/3/dm/public/0726/Proposed_Annex_191B.pdf.

*Cl* **191** *SC* **191.6.2.5** *P* **133** *L* **46** # 502

Razavi, Alireza — Eliyan

*Comment Type* **E** *Comment Status* **A** *late - EZ*

The acronym SNDR is used in 191.6.2.5 (transmitter linearity) and elsewhere without ever being expanded; “signal-to-noise-and-distortion ratio” does not appear anywhere in the clause.

*SuggestedRemedy*

Expand SNDR on first use, e.g., “signal-to-noise-and-distortion ratio (SNDR)”, and add it to the acronym list if one is maintained.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Implement the proposed change and add SNDR to 1.5 Abbreviations.

*Cl* **191** *SC* **191.6.3.1** *P* **136** *L* **27** # 156

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

subject/verb agreement

*SuggestedRemedy*

Change: and have passed
To: and has passed

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.6.3.1** *P* **136** *L* **31** # 510

Razavi, Alireza — Eliyan

*Comment Type* **E** *Comment Status* **A** *late - EZ*

191.6.3.1 contains a subject-verb agreement error: “The signal received at the MDI that was transmitted … and have passed through a link … shall be received…”. The singular subject “The signal” takes the plural verb “have passed”. (The parallel sentence in 191.7.3.1 correctly uses “has passed”.)

*SuggestedRemedy*

Change “have passed” to “has passed” in 191.6.3.1 for agreement with the singular subject, consistent with 191.7.3.1.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.6.3.2** *P* **136** *L* **39** # 444

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

Somehow we wrote clause 149 without a shall in the broadband noise test section, and it propagated to here. There needs to be a requirement on noise rejection, otherwise receiver sensitivity is meaningless.

*SuggestedRemedy*

Change "The BER is expected to be less than" to "The BER shall be less than" and add PICS (the pics is shown in the PICS comment, but noted so it can be deleted if this comment is rejected)

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.7.2.2** *P* **139** *L* **24** # 445

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

*Comment Type* **T** *Comment Status* **A** *191_tests*

191.7.2.1 and 191.7.2.2 define jitter for the phy transmitting 100 Mb/s. However, the jitter spec on lines 23 and 24 reference the value of J in Table 191-14. (similarly on lines 44 and 45) There is no value of J in 191-14 for a 100M+xGBASE-T PHY. As a starting point consider whether a PHY_D as leader (which is what this spec is on) it should have the same jitter spec as the equivalent PHY_S.

*SuggestedRemedy*

Add to the end of the 1st paragraph of 191.7.2.1 (after "for the definition of J."), "For an LS transmitter as Leader, use J for the equivalent HS transmitter on its partner PHY_S in Table 191-14."
Add the same sentence after "for the definition of J." in 191.7.2.2 (middle of the paragraph, P139 L44)

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.7.2.4** *P* **140** *L* **5** # 446

Zimmerman, George — CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

*Comment Type* **T** *Comment Status* **A** *191_tests*

There is only a spec for the low speed transmitter as leader, there needs to be one as follower - there appears to be a specification for that in the high speed section.

*SuggestedRemedy*

Add the following, base on the second paragraph of 191.6.2.4 to 191.7.2.4. Add PICS (TES_LS1 shown in the PICS comment) for this.
New paragraph added to 191.7.2.4 is: "In test mode 2 and using test fixture 3 as shown in Figure 191–39 for -T1 and Figure 191–40 for -V1, the
symbol transmission rate of the FOLLOWER PHY, when running off of a free-running clock, shall be
within the range 5625/48 MHz +1/–20%.

The short-term rate of frequency variation for both leader and follower shall be less than 1% / second."

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.7.2.6** *P* **140** *L* **20** # 60

Ran, Adee — Cisco Systems

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

"The effective transmit baseband symbols, x(n), is derived" - number mismatch.
Should be either "are derived" or refer to x(n) as a sequence.

*SuggestedRemedy*

Change to "The sequence of effective transmit baseband symbols, x(n), is derived"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.7.2.6** *P* **140** *L* **32** # 61

Ran, Adee — Cisco Systems

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

The text above table 191-20 refers to d<sub>out</sub> but in the table headings there is only d_in. I assume the "Encoded bits" columns should be d<sub>out</sub>.

*SuggestedRemedy*

Correct the headings per the comment.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.8.1** *P* **144** *L* **5** # 157

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

V1 may support AN

*SuggestedRemedy*

Change: MultiG+100M/100M+MultiGBASE-T1
To: MultiG+100M/100M+MultiGBASE-T1/V1
Make the same change on P144L13

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.8.1** *P* **144** *L* **8** # 158

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

V1 may support AN

*SuggestedRemedy*

Delete: MultiG+100M/100M+MultiGBASE-V1 PHYs do not support Auto-Negotiation.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.8.1** *P* **144** *L* **8** # 49

Muma, Scott — Microchip

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

I understand that -V1 auto-negotiation is optional.

*SuggestedRemedy*

Delete sentence. Change previous sentence to -T1/V1.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.8.1** *P* **144** *L* **13** # 50

Muma, Scott — Microchip

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

I understand that -V1 auto-negotiation is optional.

*SuggestedRemedy*

Change -T1 to -T1/V1

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.9** *P* **144** *L* **22** # 159

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

Not all -T1 link segments support all speeds as the maximum frequency changes with the speed for many parameters.

*SuggestedRemedy*

Change: 2.5 Gb/s, 5 Gb/s, and 10 Gb/s
To: 2.5 Gb/s, 5 Gb/s, or 10 Gb/s

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.9.1.5** *P* **146** *L* **30** # 28

Bergner, Bert — TE Connectivity

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

Screening attenuation refers to SC 149.7.1.5. This subclause defines screening attenuation with 45dB from 30MHz up to Fmax. Fmax depends on speed grade in Clause 149. Thus, we inherit the speed grade dependency from Clause 149 which will differentiate between 2.5G, 5G and 10G. This conflicts with the idea of screening and coupling attenuation in 191 to be independend of speed grade.

*SuggestedRemedy*

Change the sentens to " The screening attenuation of each -T1 link shall be as specified in 149.7.5.1 with Fmax = 4000 MHz."

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.10** *P* **147** *L* **1** # 162

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

Not all -V1 link segments support all speeds as the maximum frequency changes with the speed for many parameters.

*SuggestedRemedy*

Change: 2.5 Gb/s, 5 Gb/s, and 10 Gb/s
To: 2.5 Gb/s, 5 Gb/s, or 10 Gb/s

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.10.1.5** *P* **147** *L* **33** # 137

Long, Richard — TE Connectivity

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

Annex 149A is specified for differential pair, text needs to be added for coax.

*SuggestedRemedy*

Add the following sentence after line 33 on page 147: These methodologies shall be applied with adaptation to unbalanced coaxial cabling and shall use a single 50 Ohm termination to ground.

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

P147L33
Delete the sentence: Additional screening attenuation test methodologies are defined in Annex 149A.

---

*Cl* **191** *SC* **191.10.1.5** *P* **147** *L* **33** # 31

Bergner, Bert — TE Connectivity

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

Screening attenuation for -V1 coaxial unbalanced link segment: The sentence "Additional screening attenuation test methodologies are defined in Annex 149A." takes reference to clause 149A which defines screening attenuation measurement specifically for balanced link segments only. This may cause confusion.

*SuggestedRemedy*

Change the sentence to "The additional screening attenuation test methodologies defined in Annex 149A shall be applied with adaptation to unbalanced coaxial cabling."

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by #137.

---

*Cl* **191** *SC* **191.10.1.5** *P* **147** *L* **36** # 163

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

Change the -V1 screening attenuation frequency range to match that of -T1.

*SuggestedRemedy*

Change 10 to 30
Also on P147L42, change 10 to 30 in the equation of f.

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **191** *SC* **191.10.1.5** *P* **148** *L* **4** # 27

Bergner, Bert — TE Connectivity

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

Figure 191-51 shows screening attenuation up to 5 GHz while equation (201-19) defines it to 4 GHz only. See also Boyer_Sharma_3dm_01_0526.pdf.

*SuggestedRemedy*

Correct Figure 191-51 and show limit line up to 4 GHz.

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **191** *SC* **191.10.2** *P* **148** *L* **34** # 32

Bergner, Bert — TE Connectivity

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

Coupling parameters for -V1 coaxial link segments: The sentence "Test methodologies are specified in Annex 97B." refers to Annex 97B which specifically describes cross talk measurements for balanced cabling. Especially the description in 97A "Link segment ends not under test are terminated in 100 Ohm differential mode and 200 Ohm common mode." and Figure 97B-1 may cause confusion.

*SuggestedRemedy*

Change the sentence to "Test methodologies are specified in Annex 97B and shall be applied with adaptation to unbalanced coaxial cabling."

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add the following sentence after line 34 on page 148: These methodologies shall be applied with adaptation to unbalanced coaxial cabling and shall use a single 50 Ohm termination to ground.

*Cl* **191** *SC* **191.10.2.** *P* **148** *L* **38** # 33

Bergner, Bert — TE Connectivity

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

Coupling parameters between link segments: Reference to 149C.5: "For further information, see 149C.5." 149C is informative. 149C.5 specifically describes that "… care should be taken to avoid coupling between (MDI) ports." It recommends that PSANEXT between MDI ports is "... approximately the same level, but not greater, than ... specified in Equation (149-25)." This equation is the PSANEXT requirementd for balanced pair clause 149 link segments which is specified differently compared to (191-29). --> (149-25) PSANEXT>=min(75,80-5log10(f/100))

*SuggestedRemedy*

Replace the sentence "For further information, see 149C.5." by "The coupling between adjacent ports on a multiport MDI connector is recommended to be at the same level, but not greater, than specified for PSANEXT loss in Equation (191-20)."

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.11.2.1** *P* **151** *L* **2** # 164

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

There is no reason to list out the Fmax frequencies again as they are already defined in Equation 191-17.

*SuggestedRemedy*

Replace the 3 "For …" sentences with:
Where Fmax is given by Equation (191-17).
Do the same on P152L(17-21).

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.12.1** *P* **151** *L* **44** # 12

Ran, Adee — Cisco Systems

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

"Where coaxial cabling is used, the mechanical interface to the coaxial cabling is a single pin connector with a shield."
This subclause is under 191.12 which states that it addresses a single coaxnual cable. So the statement should not be conditional, and "cabling" should be simply "cable".

Also possibly in clause 192.

*SuggestedRemedy*

Change to "The mechanical interface to the coaxial cable is a single pin connector with a shield".

Implement in clause 192 if appropriate.

*Response* *Response Status* **C**

ACCEPT.

This comment does not apply to 192.

*Cl* **191** *SC* **191.12.2.1** *P* **151** *L* **1** # 511

Razavi, Alireza — Eliyan

*Comment Type* **T** *Comment Status* **A** *late - EZ*

191.12.2.1 (-V1 MDI return loss) states “The differential impedance at the -V1 MDI for each transmit/receiver channel …” and “For the -V1 PMD, a nominal differential characteristic is impedance of 50 Ω is used.” The -V1 medium is a single coaxial cable (single-ended), so “differential impedance” and “differential characteristic impedance” are incorrect; the sentence also has transposed words (“characteristic is impedance of”).

*SuggestedRemedy*

Replace “differential impedance” / “differential characteristic impedance” with “characteristic impedance” for -V1, and correct the transposed wording to “a nominal characteristic impedance of 50 Ω is used.” Also correct “transmit/receiver channel” to “transmit/receive channel”.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.12.2.1** *P* **151** *L* **51** # 499

Razavi, Alireza Eliyan

*Comment Type* **E** *Comment Status* **A** *late - EZ*

Typo: “transmit/receiver channel”.

*SuggestedRemedy*

Change to “transmit/receive channel”.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.12.3** *P* **153** *L* **1** # 447

Zimmerman, George CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,

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

The requirement to withstand high-voltage transients "per application requirements" is ill-specified. It could be anything. Better to make it an advisory statement.

*SuggestedRemedy*

Change "shall also withstand" to "is expected to withstand"

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by #393.

*Cl* **191** *SC* **191.12.3** *P* **153** *L* **33** # 393

Maguire, Valerie Copperopolis; aff'l w/ CME Consulting, Microchip, and

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

I am concerned that "withstanding without damage high-voltage transient noises and ESD per application requirements" is a shall statement, which generates a PICS. But, how can this be validated? This sentence appears in both clause 191 and clause 192.

*SuggestedRemedy*

In clause 191.12.3 and 192.10.3,

Change, "The single conductor of the MDI shall also withstand without damage high-voltage transient noises and ESD per application requirements."

to, "The single conductor of the MDI is capable of withstanding high-voltage transient noises and ESD per application requirements without damage."

Alternately, delete the sentence in both locations.

Grant Editor's license to adjust PICS in clause 191 and clause 192 accordingly.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

In clause 191.12.3 (P153L1) and 192.10.3 (P245L33)

Change: The single conductor of the MDI shall also withstand, without damage, high-voltage transient noises and ESD per application requirements.

To: The single conductor of the MDI should withstand, without damage, high-voltage transient noises and ESD per application requirements.

Grant Editor's license to adjust PICS in clause 191 and clause 192 accordingly.

*Cl* **191** *SC* **191.14** *P* **153** *L* **42** # 62

Ran, Adee Cisco Systems

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

"Clause 31" and "Annex 31B" should be external references.

*SuggestedRemedy*

Format as external reference (forest green).

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191** *SC* **191.14** *P* **153** *L* **45** # 13

Ran, Adee
Cisco Systems

*Comment Type* **T** *Comment Status* **R** *191_delay*

The delay constraints are given in terms of HS_PATH delay and LS_PATH delay, but the way these are defined is a sum of delay in the transmitter and the receiver of the same rate - and these are in two different devices, which are differnt PHY types and possibly from different vendors. The "shall" statement addressing the delays cannot be fulfilled or verified by a single vendor. No vendor can claim compliance to such a "shared" requirement.

Other Base-T PHYs have either defined the requirement using the sum of the transmit and receive delays of a specific implementation (e.g. 55.11, 97.10, and 149.10) or specified separate delays for the transmit and receive path (e.g. 40.11 and 96.10).

In this case it seems that the latter option is preferable because loopback is not possible so the delays must be measured separately anyway. But specifying the sum on the delays of a specific implementation would still be acceptable.

Annex 191A provides recommendations but it is informative, and does not solve the problem that the specification is split between two vendors.

Also possibly in clause 192.

*SuggestedRemedy*

Change the delay constraints to either of the following:
- Separate transmit delay and receive delay maximum values for a specific implementations, splitting the budget e.g. according to the recommendations in Annex 191A (preferred)
- Sum of transmit delay and receive delay for a specific implementation.

Implement in clause 192 if appropriate.

*Response* *Response Status* **C**

REJECT.

Annex 191A is informative because this is difficult to practically measure on a single PHY. Otherwise, this would have been made normative.

However, in a system where there are 2 PHYs (same or different vendors it does not matter) the system path delay becomes measurable and the total delay is normative and is required to support Pause.

Annex 191A is there in the spirit that vendors will voluntary meet this so that the system integrator can meet the normative spec. It also eliminates uncertainty for PHY vendors on how much delay to target. If a vendor meets the target voluntarily, they would know they will be compliant in a system when working with another vendor who meets the number voluntarily.

*Cl* **191** *SC* **191.14** *P* **154** *L* **3** # 14

Ran, Adee
Cisco Systems

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

Table 191-24 has numbers in bit times and pause quanta, and also in ns. The bit times and pause quanta depend on the the bit rate which is different in each direction (LS_PATH or HS_PATH), while the delay in ns does not.
There is no definition or reference for the bit time or pause quantum in each case.

I assume the first 6 rows use the high-speed bit times and the last row uses the low-speed bit times, but it takes time to figure out. It is not clear from the table that the last row has different units than the rest.

Also possibly in clause 192.

*SuggestedRemedy*

Add footnotes to the bit times and pause quanta headings and indicate the value in each data rate.

Implement in clause 192 if appropriate.

*Response* *Response Status* **C**

REJECT.

This is done the same in Clauses 97, 149, and 165.

This does not apply to 192.

*Cl* **191** *SC* **191.15** *P* **156** *L* **45** # 86

Lusted, Kent
Synopsys

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

PICS entries for 192.15.3, 192.15.4.1, and 192.15.4.2 are incomplete

*SuggestedRemedy*

Complete PIC entries

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Accommodated by #448.

Cl **191** SC **191.15.3** P **156** L **45** # 283

Jones, Peter — Cisco Systems

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

PICS are missing.

*SuggestedRemedy*

Complete PICS

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Accommodated by #448.

Cl **191** SC **191.15.3** P **156** L **46** # 15

Ran, Adee — Cisco Systems

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

PICS tables are empty

Also possibly in clause 192.

*SuggestedRemedy*

Populate them.

Implement in clause 192 if appropriate.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by #448.

Cl **191** SC **191.15.3** P **156** L **46** # 119

Kim, Yong — General Motors

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

This sub-clause on, PICS Profoma is incomplete. Please complete.

*SuggestedRemedy*

Please complete.

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Accommodated by #448.

Cl **191A** SC **191A** P **252** L **1** # 489

Dawe, Piers — Nvidia

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

There should be an editing instruction indicating whether this annex is new or being amended

*SuggestedRemedy*

Add the right editing instruction

*Response* *Response Status* **C**

ACCEPT.

Cl **191A** SC **191A** P **252** L **20** # 129

Turner, Max — Ethernovia

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

explicitly state we measure XGMII to MDI

*SuggestedRemedy*

The HS_PATH delay of 201.14 is composed of the HS_TX delay in the PHY_S (XGMII to MDI) and the HS_RX delay in the PHY_D (MDI to XGMII) .

*Response* *Response Status* **C**

ACCEPT.

Cl **191A** SC **191A** P **252** L **23** # 130

Turner, Max — Ethernovia

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

explicitly state we measure XGMII to MDI

*SuggestedRemedy*

The LS_PATH delay of 201.14 is composed of the LS_TX delay in the PHY_D (XGMII to MDI) and the LS_RX delay in the PHY_S (MDI to XGMII).

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191A** *SC* **191A** *P* **252** *L* **29** # 131

Turner, Max — Ethernovia

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

the "HS_TX TX_Delay" nomenclature seems excessive

*SuggestedRemedy*

a) The HS_TX delay is allocated 10% of the HS_PATH delay budget of Table 191-24.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191A** *SC* **191A** *P* **252** *L* **30** # 132

Turner, Max — Ethernovia

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

the "HS_RX RX_Delay" nomenclature seems excessive

*SuggestedRemedy*

b) The HS_RX delay is allocated 90% of the H S_PATH delay budget of Table 191-24.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191A** *SC* **191A** *P* **252** *L* **31** # 133

Turner, Max — Ethernovia

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

the "LS_TX TX_Delay" nomenclature seems excessive

*SuggestedRemedy*

c) The LS_TX delay is allocated 25% of the LS_PATH delay budget of Table 191-24.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191A** *SC* **191A** *P* **252** *L* **32** # 134

Turner, Max — Ethernovia

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

the "LS_RX RX_Delay" nomenclature seems excessive

*SuggestedRemedy*

d) The LS_RX delay is allocated 75% of the LS_PATH delay budget of Table 191-24.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **191A** *SC* **191A** *P* **253** *L* **25** # 135

Turner, Max — Ethernovia

*Comment Type* **TR** *Comment Status* **D** *191A*

get rid of the “frame or superframe” wording in the Figure, in lines 12, 15 and 17, as well as in the last paragraph
As per page 162 of the draft
“The RS-FEC output superframe consists of L × 3600 bits”
I.e. for L=1 the superframe consists of a single frame – superframe is always correct, “frame or superframe” is ambiguous, as this will not work for the 3rd frame in an L=4 superframe.
So we can always just use “superframe”

*SuggestedRemedy*

Replace last paragraph: Due to potential interleaving only the XGMII transfer X(n) encoded into the first 64B/65B block of an RS-FEC superframe (identical to the RS-FEC frame for L=1, per 202.3.2.2.14) can practically be used to define the delay between XGMII and MDI (or vice versa). As this is not accessible easily, it is recommended for the PHY implementers to specify TX delay and RX delay in the product's documentation and keep their variation low.

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

TFTD

*Cl* **192** *SC* **192** *P* **158** *L* **1** # 240

Ahuja, Ramanjit — Onsemi

*Comment Type* **TR** *Comment Status* **D** *1G*

Support for a 1 Gbps Mode in Low Speed Direction to be used with 5 Gbps and 7.5 Gbps Modes in the HS direction for the TDD PHY must be included.

*SuggestedRemedy*

The 1 Gbps mode support should be added according to the proposal made in https://www.ieee802.org/3/dm/public/adhoc/060226/chini_3dm_02a_D2d0_1G_comments-preview.pdf

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Accommodated by Comment #358.

*Cl* **192** *SC* **192** *P* **158** *L* **1** # 330

Pal, Debajyoti Onsemi

*Comment Type* **TR** *Comment Status* **A** *7.5G*

Support for a 7.5 Gbps Mode for the High Speed Direction in TDD PHY must be included.

*SuggestedRemedy*

The 7.5Gbps mode support should be added according to the proposal made in https://www.ieee802.org/3/dm/public/adhoc/060226/gorshe_3dm_02a_D2d0_7d5G-comments.pdf

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by Comment #357.

*Cl* **192** *SC* **192** *P* **158** *L* **1** # 239

Ahuja, Ramanjit Onsemi

*Comment Type* **TR** *Comment Status* **A** *7.5G*

Support for a 7.5 Gbps Mode for the High Speed Direction in TDD PHY must be included.

*SuggestedRemedy*

The 7.5Gbps mode support should be added according to the proposal made in https://www.ieee802.org/3/dm/public/adhoc/060226/gorshe_3dm_02a_D2d0_7d5G-comments.pdf

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by Comment #357.

*Cl* **192** *SC* **192** *P* **158** *L* **1** # 331

Pal, Debajyoti Onsemi

*Comment Type* **TR** *Comment Status* **D** *1G*

Support for a 1 Gbps Mode in Low Speed Direction to be used with 5 Gbps and 7.5 Gbps Modes in the HS direction for the TDD PHY must be included.

*SuggestedRemedy*

The 1 Gbps mode support should be added according to the proposal made in https://www.ieee802.org/3/dm/public/adhoc/060226/chini_3dm_02a_D2d0_1G_comments-preview.pdf

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Accommodated by Comment #358.

*Cl* **192** *SC* **192** *P* **158** *L* **1** # 491

Zerna, Conrad NXP

*Comment Type* **TR** *Comment Status* **A** *7.5G*

Proposed speed of 7.5Gbps is not included in the draft

*SuggestedRemedy*

Add proposed highlights from https://www.ieee802.org/3/dm/public/adhoc/060226/gorshe_3dm_02a_D2d0_7d5G-comments.pdf into the draft

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by Comment #357.

*Cl* **192** *SC* **192** *P* **158** *L* **1** # 492

Zerna, Conrad NXP

*Comment Type* **TR** *Comment Status* **D** *1G*

Proposed speed of 1Gbps is not included in the draft

*SuggestedRemedy*

Add proposed green highlights from https://www.ieee802.org/3/dm/public/adhoc/060226/chini_3dm_02a_D2d0_1G_comments-preview.pdf
Into the draft

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Accommodated by Comment #358.

*Cl* **192** *SC* **192** *P* **158** *L* **1** # 453

RAJAGOPAL, KARTHIK TEXAS INSTRUMENTS INC

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

The draft as looked at an IEEE standard to facilitate interoperability fails to offer a clear implementation guide with more than 1 type of implementation/standard to choose from. Sections 191 and 192 with their widely different PCS & PMA layers fails to fulfil the primary goal which is to be a standard. This would not qualify as standard if users are free to choose from multiple implementations which tries to achieve the same function.

*SuggestedRemedy*

Rather than letting users guess or arbitrarily choose 1 of the 2 types of PCS & PMA implementation, a technically superior implementation needs to be selected and made as a standard with clear guideline on the PCS and PMA layers. This way facilitates maximum interoperability, which is the only path for this draft to be considered as an IEEE standard

*Response* *Response Status* **C**

REJECT.

The CRG disagrees with the commenter.

The PHYs in Clause 191 and Clause 192 present different feature sets which meet the distinct identities which meet different objectives approved by the WG. See https://ieee802.org/3/dm/public/0326/Objectives_ISAAC_01_0326.pdf.

Users may select which PHY to use based on which features they value.

*Cl* **192** *SC* **192.1** *P* **158** *L* **11** # 16

Ran, Adee Cisco Systems

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

"They also use the same TDD cycle for all data rates (see 192.3)"

Cross-reference seems to be incorrect.

*SuggestedRemedy*

Change to 192.3.4.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.1** *P* **158** *L* **16** # 243

Steve, Gorshe Microchip Technology

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

PAM terminology correction

*SuggestedRemedy*

Change "PAM 2" to "PAM2" (4 places) and "PAM 4" to "PAM4" (1place)

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

(Editor's note: PAM 2 could only be found in three places in the document.)

Change "PAM 2" to "PAM2" on P116L24, P158L18, and P158L18.

Change "PAM 4" to "PAM4" on P158L18.

*Cl* **192** *SC* **192.1** *P* **158** *L* **22** # 165

Wienckowski, Natalie IVN Solutions LLC; Ethernovia & Bosch

*Comment Type* **E** *Comment Status* **A** *EZ - pull*

typo

*SuggestedRemedy*

Change: 64/65B To: 64B/65B

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Also correct on P188L43.

Editorial license to adjust for any other similar errors.

*Cl* **192** *SC* **192.1** *P* **158** *L* **28** # 451

Ganesan, Aravind — Texas Instruments

*Comment Type* **T** *Comment Status* **A** *192_overview*

In multi lane operation does the PHY_D synchronize all the TDD slots?

*SuggestedRemedy*

The recommendation for TDD slots synchronisation multi lane operation can be given.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Insert the following new paragraph on P158,L33:
"A device that supports multiple simultaneous MultiGBASE-A PHYs may choose to align the start time of its transmit TDD cycle across links operating as the LEADER to reduce crosstalk. Such an alignment is optional and implementation specific."

*Cl* **192** *SC* **192.1** *P* **158** *L* **28** # 450

Ganesan, Aravind — Texas Instruments

*Comment Type* **TR** *Comment Status* **R** *192_overview*

The paragraph talks about the timing operations at the follower. it is expected that the follower locks on to the leader clock. The accuracy requirement of the lock and holdover quality of the leader clock is not mentioned.

*SuggestedRemedy*

The accuracy requirement of the clock lock and holdover performance of the follower needs to be mentioned.

*Response* *Response Status* **W**

REJECT.

This topic is covered by the information in:
192.5.2.6 Transmitter clock frequency
192.5.2.3 Transmitter timing jitter and jitter at the MDI
192.4.2.4.11 Startup sequence

*Cl* **192** *SC* **192.1** *P* **158** *L* **28** # 36

Muma, Scott — Microchip

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

"The LEADER-FOLLOWER
relationship is predetermined via management control during initialization or via default hardware setup." appears at L28 and L31, delete one

*SuggestedRemedy*

Delete duplicate sentence L28-29, keep L31-32.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.1** *P* **158** *L* **30** # 238

Chandrasekhar Sriram

*Comment Type* **T** *Comment Status* **D** *192_overview*

The draft suggests that the FOLLOWER phy recovers the clock from the received signal, but this clock is not available during time when LEADER's transmit is switched off (as part of time duplexing). Moreover since the time duration of the LEADER's transmit/FOLLOWER's receive is much less than FOLLOWER's transmit, I believe this implementation will lead to a very complicated CDR to deal with clock drifts.

*SuggestedRemedy*

Suggest scraping this LEADER/FOLLOWER concept for TDD or give an option to the implementer to use an independent clock source for the FOLLOWER.

*Proposed Response* *Response Status* **W**

PROPOSED REJECT.

CRG disagrees with the commenter. Xyz.pdf shows that this is possible for TDD implementations.

*Cl* **192** *SC* **192.1.1** *P* **158** *L* **46** # 63

Ran, Adee — Cisco Systems

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

The symbols N_r, N_p, and N_z would be better written using subscript format for the r, n, and p, as is typically done for mathematical parameters, instead of using an underscore character. This would make their use in equations (e.g. 192-11) appear more readable. Similarly for N_inf and N_TDD on page 198 and possibly other symbols.

*SuggestedRemedy*

Change the symbols in 192.1.1.1 per the comment, and apply corresponding changes in the text throughout the document (43 instances of N_r, 42 of N_p, 21 of N_z).

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.1.1** *P* **159** *L* **1** # 109

Huber, Thomas Nokia

*Comment Type* **E** *Comment Status* **D** *Editorial*

The wording for the aggregate terminology below the figure is a bit awkward: "When talking about the asymmetric PHY communicating on a shielded, balanced, pair of conductors, regardless of transmit bit rate, use: ", etc.

*SuggestedRemedy*

Delete the definitions below the figure. Add these to the list of nomenclature that is above the table:
MultiGBASE-AT1 Refers to the asymmetric PHY communicating on a shielded, balanced, pair of conductors
MultiGBASE-AV1 Refers to the asymmetric communicating on a coaxial cable
MultiGBASE-A Refers to all PHYs regardless of cable type or bit rate

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

(Editor's note: "shielded, balanced, pair" should simply be "shielded balanced pair". "PHY" is missing from the MultiGBASE-AV1 nomenclature. No change is required to clause 191 if Comment #281 is accepted.)

Delete lines 1 - 11 on page 159.

Add these to the list of nomenclature that is above the table:

MultiGBASE-AT1 Refers to the asymmetric PHY communicating on a shielded balanced pair of conductors
MultiGBASE-AV1 Refers to the asymmetric PHY communicating on a coaxial cable
MultiGBASE-A Refers to all PHYs regardless of cable type or bit rate

*Cl* **192** *SC* **192.1.1** *P* **159** *L* **17** # 219

Matheus, Kirsten BMW Group

*Comment Type* **TR** *Comment Status* **A** *7.5G*

Add a 7.5 Gb/s HS PHY option for use with Clause 192

*SuggestedRemedy*

Add 7.5 Gb/s HS PHY support in accordance with changes proposed in https://www.ieee802.org/3/dm/public/adhoc/060226/gorshe_3dm_02_D2d0_7d5G-comments.pdf.

Note: for efficiency reasons the referenced page, sub-clause and line # in this comment is reduced to a single sub-clause (192.1.1). All relevant pages, sub-clauses and lines that require update can be seen in the referenced markup file (gorshe_3dm_02_D2d0_7d5G-comments.pdf).

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Accommodated by Comment #357.

*Cl* **192** *SC* **192.1.1** *P* **159** *L* **17** # 263

Tazebay, Mehmet Broadcom

*Comment Type* **TR** *Comment Status* **R** *1G*

Add 7.5 Gb/s High Speed direction PHY and 1000 Mb/s Low Speed direction PHY support in Clause 192

*SuggestedRemedy*

Add 7.5 Gb/s High Speed direction PHY and 1000 Mb/s Low Speed direction PHY support according to changes proposed in https://www.ieee802.org/3/dm/public/adhoc/060226/chini_3dm_02a_D2d0_1G_comments-preview.pdf, with editorial license.

*Response* *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Accommodated by Comment #358.

*Cl* **192** *SC* **192.1.1** *P* **159** *L* **17** # 264

Tazebay, Mehmet — Broadcom

*Comment Type* **TR** *Comment Status* **R** *1G*

Add a 5 Gb/s High Speed direction and 1000 Mb/s Low Speed direction PHY support in Clause 192

*SuggestedRemedy*

Add 5 Gb/s High Speed direction PHY and 1000 Mb/s Low Speed direction PHY support according to changes proposed in https://www.ieee802.org/3/dm/public/adhoc/060226/chini_3dm_02a_D2d0_1G_comments-preview.pdf, with editorial license.

*Response* *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

Accommodated by Comment #358.

*Cl* **192** *SC* **192.1.1** *P* **159** *L* **17** # 262

Tazebay, Mehmet — Broadcom

*Comment Type* **TR** *Comment Status* **A** *7.5G*

Add a 7.5 Gb/s High Speed direction PHY support in Clause 192

*SuggestedRemedy*

Add a 7.5 Gb/s High Speed direction PHY support https://www.ieee802.org/3/dm/public/adhoc/060226/gorshe_3dm_02_D2d0_7d5G-comments.pdf, with editorial license.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by Comment #357.

*Cl* **192** *SC* **192.1.1** *P* **159** *L* **17** # 224

Lee, Ching-Yen — Realtek Semiconductor Corp.

*Comment Type* **TR** *Comment Status* **R** *1G*

For the high-speed/low-speed options, add 7.5 Gbps/1 Gbps and 5 Gbps/1 Gbps to Clause 192.

*SuggestedRemedy*

With editorial license, implement the changes proposed in https://www.ieee802.org/3/dm/public/adhoc/060226/chini_3dm_02a_D2d0_1G_comments-preview.pdf

*Response* *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **192** *SC* **192.1.1** *P* **159** *L* **17** # 220

Matheus, Kirsten — BMW Group

*Comment Type* **TR** *Comment Status* **D** *1G*

Add a 1 Gb/s LS PHY option for use with Clause 192

*SuggestedRemedy*

Add 1 Gb/s LS PHY support in accordance with changes proposed in https://www.ieee802.org/3/dm/public/adhoc/060226/chini_3dm_02a_D2d0_1G-comment-preview.pdf

Note: for efficiency reasons (the referenced page, sub-clause and line # in this comment is reduced to a single sub-clause (192.1.1). All relevant pages, sub-clauses and lines that require updates can be seen in the referenced markup file (chini_3dm_02a_D2d0_1G-comment-preview.pdf).

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Accommodated by Comment #358.

*Cl* **192** *SC* **192.1.1** *P* **159** *L* **17** # 357

Wang, Frank — Realtek Semiconductor Corp.

*Comment Type* **TR** *Comment Status* **A** *7.5G*

In clause 192, add a 7.5 Gb/s PHY option for high-speed path.

*SuggestedRemedy*

With editorial license, implement the changes proposed in https://www.ieee802.org/3/dm/public/adhoc/060226/gorshe_3dm_02a_D2d0_7d5G-comments.pdf

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

TFTD

(Editor's Note: Resolution of this comment resolves Comments #219, #221, #223, #225, #235, #239, #255, #262, #265, #267, #270, #273, #330, #491, and #495. Filter by Topic In("7.5G") to locate comments.)

Incorporate changes indicated with revision marks from https://www.ieee802.org/3/dm/public/adhoc/060226/gorshe_3dm_02a_D2d0_7d5G-comments.pdf into the draft

Editorial license granted to conform with Style, etc. (blue highlights in the contribution above provide assisting implementation notes for the Editor).

*Cl* **192** *SC* **192.1.1** *P* **159** *L* **17** # 496

Lin, YK — Realtek Semiconductor Corp.

*Comment Type* **T** *Comment Status* **R** *late -1G*

Add two options:
7.5 Gb/s in the HS_PATH with 1 Gb/s in the LS_PATH
5 Gb/s in the HS_PATH with 1 Gb/s in the LS_PATH

*SuggestedRemedy*

With editorial license, add 1 Gb/s in the LS_PATH (with 5G/7.5G bps in the HS_PATH) according to the changes proposed in https://www.ieee802.org/3/dm/public/adhoc/060226/chini_3dm_02a_D2d0_1G_comments-preview.pdf

*Response* *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

This comment was WITHDRAWN by the commenter.

*Cl* **192** *SC* **192.1.1** *P* **159** *L* **17** # 495

Lin, YK — Realtek Semiconductor Corp.

*Comment Type* **T** *Comment Status* **A** *late - 7.5g*

Add an option of 7.5 Gb/s in the HS_PATH with 100 Mb/s in the LS_PATH

*SuggestedRemedy*

With editorial license, add 7.5 Gb/s in the HS_PATH according to the changes proposed in https://www.ieee802.org/3/dm/public/adhoc/060226/gorshe_3dm_02a_D2d0_7d5G-comments.pdf

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by Comment #357.

*Cl* **192** *SC* **192.1.1** *P* **159** *L* **17** # 226

Schedl, Anton — BMW Group

*Comment Type* **TR** *Comment Status* **D** *1G*

Add a 1 Gb/s LS PHY option for use with Clause 192

*SuggestedRemedy*

Add 1 Gb/s LS PHY support according to changes proposed in https://www.ieee802.org/3/dm/public/adhoc/060226/chini_3dm_02a_D2d0_1G-comment-preview.pdf)

Note: for efficiency reasons (i.e., avoid a lot of duplicates in the comments) the referenced page, sub-clause and line # in this comment is reduced to a single sub-clause (192.1.1). All relevant pages, sub-clauses and lines that require updates can be seen in the referenced markup file (chini_3dm_02a_D2d0_1G-comment-preview.pdf).

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Accommodated by Comment #358.

*Cl* **192** *SC* **192.1.1** *P* **159** *L* **17** # 358

Wang, Frank — Realtek Semiconductor Corp.

*Comment Type* **T** *Comment Status* **D** *1G*

In clause 192, add 1 Gb/s data rate for low-speed path when the data rates in high-speed path are 7.5 Gb/s or 5 Gb/s.

*SuggestedRemedy*

With editorial license, implement the changes proposed in https://www.ieee802.org/3/dm/public/adhoc/060226/chini_3dm_02a_D2d0_1G_comments-preview.pdf

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

TFTD

(Editor's Note: Resolution of this comment resolves Comments #220, #222, #224, #226, #236, #240, #256, #263, #264, #266, #268, #268, #271, #272, #274, #275, #331, #492, and #496. Filter by Topic In("1G") to locate comments.)

Incorporate changes indicated with green highlights from https://www.ieee802.org/3/dm/public/adhoc/060226/chini_3dm_02a_D2d0_1G_comments-preview.pdf into the draft

Editorial license granted to conform with Style, etc.

*Cl* **192** *SC* **192.1.1** *P* **159** *L* **17** # 223

Lee, Ching-Yen — Realtek Semiconductor Corp.

*Comment Type* **TR** *Comment Status* **A** *7.5G*

For the high-speed/low-speed options, add 7.5 Gbps/100 Mbps to Clause 192.

*SuggestedRemedy*

With editorial license, implement the changes proposed in https://www.ieee802.org/3/dm/public/adhoc/060226/gorshe_3dm_02a_D2d0_7d5G-comments.pdf

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Accommodated by Comment #357.

*Cl* **192** *SC* **192.1.1** *P* **159** *L* **17** # 222

Veloso, Gumersindo — BMW Group

*Comment Type* **TR** *Comment Status* **D** *1G*

Add a 1 Gb/s LS PHY option for use with Clause 192

*SuggestedRemedy*

Add 1 Gb/s LS PHY support according to changes proposed in https://www.ieee802.org/3/dm/public/adhoc/060226/chini_3dm_02a_D2d0_1G-comment-preview.pdf) and adapt any affected chapter/subchapter as can be seen under chini_3dm_02a_D2d0_1G-comment-preview.pdf.

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Accommodated by Comment #358.

*Cl* **192** *SC* **192.1.1** *P* **159** *L* **17** # 221

Veloso, Gumersindo — BMW Group

*Comment Type* **TR** *Comment Status* **A** *7.5G*

Add a 7.5 Gb/s HS PHY option for use with Clause 192

*SuggestedRemedy*

Add 7.5 Gb/s HS PHY support according to changes proposed in https://www.ieee802.org/3/dm/public/adhoc/060226/gorshe_3dm_02_D2d0_7d5G-comments.pdf and adapt any affected chapter/subchapter as can be seen under gorshe_3dm_02_D2d0_7d5G-comments.pdf.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by Comment #357.

*Cl* **192** *SC* **192.1.1** *P* **159** *L* **17** # 225

Schedl, Anton — BMW Group

*Comment Type* **TR** *Comment Status* **A** *7.5G*

Add a 7.5 Gb/s HS PHY option for use with Clause 192

*SuggestedRemedy*

Add 7.5 Gb/s HS PHY support according to changes proposed in https://www.ieee802.org/3/dm/public/adhoc/060226/gorshe_3dm_02_D2d0_7d5G-comments.pdf.

Note: for efficiency reasons (i.e., avoid a lot of duplicates in the comments) the referenced page, sub-clause and line # in this comment is reduced to a single sub-clause (192.1.1). All relevant pages, sub-clauses and lines that require update can be seen in the referenced markup file (gorshe_3dm_02_D2d0_7d5G-comments.pdf).

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by Comment #357.

---

*Cl* **192** *SC* **192.1.2** *P* **160** *L* **21** # 37

Muma, Scott — Microchip

*Comment Type* **E** *Comment Status* **D** *PMD*

Text says PHY sublayers are shown shaded, but PMD is not shaded.

*SuggestedRemedy*

Shade PMD blocks in Figure 192-1.

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Accommodated by Comment #64.

---

*Cl* **192** *SC* **192.1.2** *P* **160** *L* **35** # 64

Ran, Adee — Cisco Systems

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

The stack in figure 192-2 includes "PMD" boxes. But these PHYs do not have a PMD sublayer (based on the clause title and lack of a PMD subclause). The AT1 and AV1 are PHYs for different media, and the differences are in the MDI (per 192.1.6).

There are other mentions of "PMD" in 192.9.2.1 and 192.10.2.1, and in the PICS.

*SuggestedRemedy*

Delete the PMD boxes and legend item from the figure.
Delete other mentions of PMD from the clause.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Grant the clause 192 Editor license to work with the TDD champion to review use of "PMD" and make updates where appropriate.

It is expected that PMD will be replaced with PMA or MDI, as appropriate. The only exception is the use of "pmd" in a register name.

---

*Cl* **192** *SC* **192.1.2** *P* **167** *L* **33** # 166

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

atypical order

*SuggestedRemedy*

Change: FOLLOWER-LEADER
To: LEADER-FOLLOWER

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **192** *SC* **192.1.3.1** *P* **162** *L* **17** # 244

Steve, Gorshe — Microchip Technology

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

I thought we had agreed that for consistency with other IEEE 802.3 clauses, the symbol size should be omitted from within the parentheses.

*SuggestedRemedy*

RS-FEC(128,122,8) should be just RS-FEC(128,122)

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.1.3.1** *P* **162** *L* **20** # 336

Wang, Frank — Realtek Semiconductor Corp.

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

insert a space between "Duration" and "="

*SuggestedRemedy*

change "Duration=" to "Duration ="

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.2.1.1.1** *P* **167** *L* **6** # 65

Ran, Adee — Cisco Systems

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

"The parameter tx_mode can take on one of the following values of the form"
These are just the values, not form.

*SuggestedRemedy*

Delete "of the form"

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Delete "of the form" in the following locations:

P70, L2
P70, L36
P72, L25
P73, L1
P73, L31
P167, L6
P167, L42
P169, L15
P169, L38
P170, L14
P170, L42
P171, L15

*Cl* **192** *SC* **192.2.1.3.1** *P* **168** *L* **18** # 167

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

reword to make definitions parallel

*SuggestedRemedy*

Change: 10 Gb/s transmit payload in data mode
To: in data mode for10 Gb/s mode data payloads

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

(Editor's note: Page number changed from 169 to 168 in comment file.)

Accommodated by Comment #337.

*Cl* **192** *SC* **192.2.1.3.1** *P* **168** *L* **20** # 337

Wang, Frank — Realtek Semiconductor Corp.

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

the text for {-1, +1} is not clear to read

*SuggestedRemedy*

change "in data and training modes for all refresh header, 2.5 Gb/s mode, and 5 Gb/s mode data payloads."
to "2.5 Gb/s or 5 Gb/s transmit payload in data mode and all refresh header in data and training modes."

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

(Editor's note: "refresh header" should be "refresh header symbols".)

Change "in data and training modes for all refresh header, 2.5 Gb/s mode, and 5 Gb/s mode data payloads."

to "2.5 Gb/s or 5 Gb/s transmit payload in data mode and all refresh header symbols in data and training modes."

*Cl* **192** *SC* **192.2.1.9** *P* **171** *L* **8** # 168

Wienckowski, Natalie IVN Solutions LLC; Ethernovia & Bosch

*Comment Type* **T** *Comment Status* **D** *Editorial*

There is a "from" but no "to".

*SuggestedRemedy*

Change: from their initialization states.
To: from their initialization states to their data states.

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

(Editor's note: Referring to the non-initialization states as "data states" may not be accurate.)

Replace, "This primitive indicates whether or not the PCS state diagrams are able to transition from their initialization
states."

with, "This primitive indicates when the PCS 64B/65B state diagrams are able to process data."

Consider replacing this text is clause 191 as well.

*Cl* **192** *SC* **192.3.2** *P* **171** *L* **37** # 169

Wienckowski, Natalie IVN Solutions LLC; Ethernovia & Bosch

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

improve wording and add OAM

*SuggestedRemedy*

Change: The PCS comprises one PCS Reset function and two simultaneous and synchronous operating functions. The PCS operating functions are PCS Transmit and PCS Receive..
To: The PCS comprises the following functions: PCS Reset, PCS Transmit, PCS Receive, and an optional PCS OAM. The PCS Transmit and PCS Receive functions execute simultaneously and asynchronously.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

(Editor's note: Line number changed from 22 to 168 in comment file. No other change to Suggested Remedy.)

Change: The PCS comprises one PCS Reset function and two simultaneous and synchronous operating functions. The PCS operating functions are PCS Transmit and PCS Receive.

To: The PCS comprises the following functions: PCS Reset, PCS Transmit, PCS Receive, and an optional PCS OAM. The PCS Transmit and PCS Receive functions execute simultaneously and asynchronously.

*Cl* **192** *SC* **192.3.2.2** *P* **172** *L* **51** # 394

Maguire, Valerie Copperopolis; aff'l w/ CME Consulting, Microchip, and

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

A word seems to be missing.

*SuggestedRemedy*

Replace, "...to the PCS Transmit bit ordering (see Figure 192-5 and Figure 192-6)."

with, "...to the PCS Transmit bit order mapping (see Figure 192-5 and Figure 192-6).

Grant Editor's license to modify PICS to align if a change is made.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace, "...to the PCS Transmit bit ordering (see Figure 192-5 and Figure 192-6)."

with, "...to the PCS Transmit bit ordering in Figure 192-5 and Figure 192-6."

*Cl* **192** *SC* **192.3.2.2** *P* **173** *L* **12** # 170

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

numberssmaller than 10 should be written out per the IEEE Style manual

*SuggestedRemedy*

Change: 1, To: one

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

(Editor's note: To be clear there isn't a "," after the "1".)

Change: "1"
To: "one"

---

*Cl* **192** *SC* **192.3.2.2** *P* **173** *L* **14** # 245

Steve, Gorshe — Microchip Technology

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

The wording "a PAM2 symbol" implies all of the 1040 bits are mapped to a single PAM2 symbol

*SuggestedRemedy*

Consistent with the wording in the next paragraph, replace "a PAM2 symbol" with "PAM2 symbols"

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **192** *SC* **192.3.2.2** *P* **173** *L* **29** # 171

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

add a reference to the figure that shows the TDD cycle.

*SuggestedRemedy*

After: to complete the TDD cycle.
Add (See Figure 192-17 and Figure 192-18.)

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace, "...to complete the TDD cycle."

with, "...to complete the TDD cycle (see Figure 192-17 and Figure 192-18)."

---

*Cl* **192** *SC* **192.3.2.2** *P* **173** *L* **43** # 172

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

The sequence is not generated to the PMA, it is generated and passed to the PMA.

*SuggestedRemedy*

Change: shall generate a sequence (On) defined in 192.3.4 to the PMA
To: shall generate a sequence (On) defined in 192.3.4, which is passed to the PMA

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

(Editor's note: Seems as though an "as" is missing here, too.)

Change: shall generate a sequence (On) defined in 192.3.4 to the PMA

To: shall generate a sequence (On) as defined in 192.3.4, which is passed to the PMA

---

*Cl* **192** *SC* **192.3.2.2** *P* **173** *L* **47** # 173

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

missing article

*SuggestedRemedy*

Change: makes request
To: makes a request

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change: makes request

To: requests the

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*Cl* **192** *SC* **192.3.2.2** *P* **173** *L* **52** # 174

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

use a non-breaking hyphen

*SuggestedRemedy*

Change the hyphen in 17-bit to a non-breaking hyphen to keep 17-bit on the same line.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.3.2.2** *P* **173** *L* **54** # 246

Steve, Gorshe — Microchip Technology

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

Since "RS-FEC(130,124) has already been introduced, it is better to use consistent RS-FEC language

*SuggestedRemedy*

Replace "(130,124) RS-FEC" with "RS-FEC(130,124)"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.3.2.2** *P* **174** *L* **4** # 247

Steve, Gorshe — Microchip Technology

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

Since "RS-FEC(128,122) has already been introduced, it is better to use consistent RS-FEC language

*SuggestedRemedy*

Replace "(128,122) RS-FEC" with "RS-FEC(128,122)"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.3.2.2** *P* **174** *L* **11** # 175

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

break up sentence

*SuggestedRemedy*

Change: complete a full TDD cycle of symbols, and then the process is repeated for each TDD cycle.
To: complete a full TDD cycle of symbols. The process is repeated for each TDD cycle.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.3.2.2** *P* **174** *L* **43** # 17

Ran, Adee — Cisco Systems

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

"PCS Transmit shall generate a sequence (On) defined in 192.3.4 "

Cross-reference seems to be incorrect.

*SuggestedRemedy*

Change to 192.3.4.3

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.3.2.2.1** *P* **174** *L* **16** # 338

Wang, Frank — Realtek Semiconductor Corp.

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

PMA training frame uses PAM2 only.

*SuggestedRemedy*

change "PAM2/PAM4" to "PAM2"

*Response* *Response Status* **W**

ACCEPT.

*Cl* **192** *SC* **192.3.2.2.4** *P* **177** *L* **23** # 66

Ran, Adee — Cisco Systems

*Comment Type* **T** *Comment Status* **A** *192_PCS*

The 64B65B coding in this clause seems identical to the one used in previous PHYs (such as clause 149, which is referenced by Clause 191.
If it is the same, it should be referred back too, for consistency and ease of reading and reviewing.
If there are differences, it would help the reader if they are indicated.

*SuggestedRemedy*

Replace the content of 192.3.2.2.4 through 192.3.2.2.11 with references to clause 149, as done in 191.3.2.2.2 through 191.3.2.2.11 and in 191.4.2.2.4 thtough 191.4.2.2.11.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Editorial license to add notes that 192.x.y.z is identical to 149.a.b.c.

*Cl* **192** *SC* **192.3.2.2.4** *P* **177** *L* **28** # 248

Steve, Gorshe — Microchip Technology

*Comment Type* **E** *Comment Status* **A** *192_PCS*

Suggestion to improve the flow and reduce redundancy of this and the following first paragraph of 193.2.2.5 (line 3 of pp. 179).

*SuggestedRemedy*

Suggested replacement for the paragraphs beginning in Line 28 and 33: "As illustrated in Figure 192-7, data blocks contain eight data characters and control blocks begin with an eight-bit block type field that indicates the format of the remainder of the block."

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Delete lines 28 through 40.

Replace with, "Data blocks contain eight data characters. Control blocks begin with an eight-bit block type field that indicates the format of the remainder of the block.

64B/65B block formats are shown in Figure 192-7. The column labeled Input Data shows, in abbreviated form, the eight characters used to create the 65-bit block. These characters are either data characters or control characters and, when transferred across the XGMII interface, the corresponding TXC or RXC bit is set accordingly. Within the input data column, D0 through D7 are data octets and are transferred with the corresponding TXC or RXC bit set to zero. All other characters are control octets and are transferred with the corresponding TXC or RXC bit set to one. Each control block contains eight characters. For control blocks containing a Start or Terminate character, as indicated by an S or T octet in the Figure 192-7 Input Data field, that character is implied by the block type field. Other control characters are encoded in a seven-bit control code or a four-bit O Code. The single bit fields in control blocks (thin rectangles with no label in the figure) are sent as zero and ignored upon receipt."

*Cl* **192** *SC* **192.3.2.2.4** *P* **177** *L* **33** # 249

Steve, Gorshe — Microchip Technology

*Comment Type* **E** *Comment Status* **A** *192_PCS*

*SuggestedRemedy*

"The specific format of the blocks is shown in Figure 192-7. The column labeled Input Data shows, in abbreviated form, the eight characters used to create the 65-bit block. These characters are either data characters or control characters and, when transferred across the XGMII interface, the corresponding TXC or RXC bit is set accordingly. Within the input data column, D0 through D7 are data octets and are transferred with the corresponding TXC or RXC bit set to zero. All other characters are control octets and are transferred with the corresponding TXC or RXC bit set to one. Each control block contains eight characters. For control blocks containing a Start or Terminate character, as indicated by an S or T octet in the Figure 192-7 Input Data field, that character is implied by the block type field. Other control characters are encoded in a seven-bit control code or a four-bit O Code. The single bit fields in control blocks (thin rectangles with no label in the figure) are sent as zero and ignored upon receipt."

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by Comment #248.

*Cl* **192** *SC* **192.3.2.2.5** *P* **179** *L* **29** # 67

Ran, Adee — Cisco Systems

*Comment Type* **T** *Comment Status* **A** *192_PCS*

Table 192-3 contains two control codes defined as ordered sets, which are encoded by block type and O code; the O codes are provided. In addition, it contains six "reserved" control codes for which the O code is listed as "reserved" too. But these are not O codes (4 bit values).

The reason for having these reserved values is unclear. Valid and reserved XGMII control characters are listed in Table 46-3 and Table 46-4 (802.3-2022), and there are many reserved ones. What is special in the six values listed here?

*SuggestedRemedy*

Delete "reserved0" through "reserved5" from the "O code" column.

Consider deleting these rows entirely.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Do not remove the rows.

Delete the words "reservedx" in the "O code" column.

*Cl* **192** *SC* **192.3.2.2.5** *P* **179** *L* **41** # 68

Ran, Adee — Cisco Systems

*Comment Type* **T** *Comment Status* **A** *192_PCS*

The designation of a special ordered set and control codes for "reserved for Fibre Channel" was made for the BASE-X PCS and then carried over to BASE-R PCS. It is unlikely that Fibre Channel will ever use the new PCS defined here or coexist on same networks, and T11 has not requested the 802.3dm task force to make these reservations. Therefore these reserved codes and ordered sets are just confusing the reader. Carrying this designation forward is not justified.

*SuggestedRemedy*

Delete the "Signal ordered set" row and update the text in 192.3.2.2.6 accordingly. Also update R_BLOCK_TYPE 192.3.5.1.3 to remove the block type field 0x55.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

In "Control character" column, change "Signal ordered set" to "Reserved".

Remove footnote "a" from the table.

This is kept as a reserved row as it is used by other devices.

*Cl* **192** *SC* **192.3.2.2.5** *P* **179** *L* **43** # 250

Steve, Gorshe — Microchip Technology

*Comment Type* **E** *Comment Status* **A** *192_PCS*

There are other Signal ordered set values in addition to the one for Fibre Channel (i.e., FlexE and MTN). If we include Fibre Channel, they should also be included in the text.

*SuggestedRemedy*

Since there is no chance that any of those applications would appear in a P802.3dm network application, I recommend deleting this note rather than elaborating the list.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by Comment #68.

*Cl* **192** *SC* **192.3.2.2.6** *P* **179** *L* **48** # 38

Muma, Scott — Microchip

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

"remote fault and Local Fault" should have consistent capitalization

*SuggestedRemedy*

Change "remote fault" to "Remote Fault"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.3.2.2.7** *P* **180** *L* **5** # 395

Maguire, Valerie — Copperopolis; aff'l w/ CME Consulting, Microchip, and

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

Follow Style

*SuggestedRemedy*

Replace "4" with "four"

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

(Editor's note: Comment Subcl entry changed from 192.3.2.7 to 192.3.2.2.7).

Replace "4" with "four"

*Cl* **192** *SC* **192.3.2.2.13** *P* **181** *L* **3** # 176

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

Improve wording and follow IEEE Style manual for numbers.

*SuggestedRemedy*

Change: Fifteen of 65B blocks
To: 15 65B blocks

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.3.2.2.14** *P* **182** *L* **1** # 69

Ran, Adee — Cisco Systems

*Comment Type* **E** *Comment Status* **A** *192_PCS*

The curved arrows in Figure 192-8 are confusing - they don't appear to include RS encoder #1. Supposedly they should denote "round-robin" but that is not the usual representation (more commonly a circular arc is used with terminals placed accordingly. The definition of the sequence under the "output encoded symbols" arrow is sufficient.

*SuggestedRemedy*

Either draw the curved arrows such that they span all the inputs and outputs (circular arcs), or just remove them.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Editor to work with TDD champion to improve the commutator to make it clear it sweeps across all RS encoders.

Editor may want to consult with George Zimmerman for final review.

*Cl* **192** *SC* **192.3.2.2.15** *P* **182** *L* **3** # 126

de Koos, Andras — Microchip Technology

*Comment Type* **ER** *Comment Status* **A** *192_PCS*

Though largely reused from Clause 149, the interleave diagram (Figure 192-8) is strange. Specifically, the input distribution and output recombine arrows don't look like they include the first FEC Encoder!

*SuggestedRemedy*

Consider modifying Figure 192-8 to more effectively show the round robin.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by Comment #69.

*Cl* **192** *SC* **192.3.2.2.15** *P* **182** *L* **3** # 39

Muma, Scott — Microchip

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

The top right text in Figure 202-15 looks like it has 2 sets of characters overlaid.

*SuggestedRemedy*

Delete overlaid non-italicized text in top right of Figure 192-15 "m122 × L-1,m121 × L-1,.,mL-1,p1,5,.,p1,0"

Retain version of text with italicized "L"s: "m122 × L-1,m121 × L-1,.,mL-1,p1,5,.,p1,0"

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

(Editor's note: The correct reference is Figure 192-8.)

Delete overlaid non-italicized text in top right of Figure 192-8 "m122 × L-1,m121 × L-1,.,mL-1,p1,5,.,p1,0"

Retain version of text with italicized "L"s: "m122 × L-1,m121 × L-1,.,mL-1,p1,5,.,p1,0"

*Cl* **192** *SC* **192.3.2.2.16** *P* **182** *L* **51** # 177

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

awkward wording

*SuggestedRemedy*

Change: which is identified with the element of
the finite field mi,0 is the first bit transmitted.
To: which is identified with the element of the finite field, where mi,0 is the first bit transmitted.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

(Editor's note: Change to align with clause 49 and P183, L25.)

Change: "..., which is identified with the element of the finite field mi,0 is the first bit transmitted."
To: "..., which is identified with the element of the finite field. mi,0 is the first bit transmitted.."

*Cl* **192** *SC* **192.3.2.2.16** *P* **183** *L* **15** # 178

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

unnecessary word

*SuggestedRemedy*

Remove "both".

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.3.2.2.16** *P* **184** *L* **1** # 70

Ran, Adee — Cisco Systems

*Comment Type* **T** *Comment Status* **A** *192_PCS*

In Figure 192-9 the output of block p<sub>1</sub> feeds the input of block p<sub>n-k-1</sub>. This seems incorrect.

*SuggestedRemedy*

Add something in between (e.g. arrows and ellipsis).

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Grant Editorial license to align with Figure 149-10. Change P2 box to ellipsis and line above P2 to ellipsis.

*Cl* **192** *SC* **192.3.2.2.17** *P* **185** *L* **8** # 71

Ran, Adee — Cisco Systems

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

Equations use a mixture of standard typography and markup-style text.

*SuggestedRemedy*

In equations 192-4 and 192-5, change "!=" to the "not equal" sign.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.3.2.2.17** *P* **185** *L* **16** # 179

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

subject/verb agreement, the subject is scrambled payload bits, not scrambled payload

*SuggestedRemedy*

Change: for PAM2 is shown
To: for PAM2 are shown

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.3.2.2.17** *P* **185** *L* **18** # 339

Wang, Frank — Realtek Semiconductor Corp.

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

formatting: italics and subscript

*SuggestedRemedy*

change "Dn[0]" to "Dn[0]"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.3.2.2.17** *P* **185** *L* **28** # 180

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

*Comment Type* **E** *Comment Status* **A** *192_PCS*

This sentences is very confusing. Do you meand the second MSB, meaning bit 7 if there were 8 bits, or do you mean the 2nd bit is the MSB. I think it is the latter and my suggestion is based on this.

*SuggestedRemedy*

Change: The first least significant bit (LSB) is DSn[0] equal to Scrn[0]. The second most significant (MSB) bit is DSn[1] .
To: The first bit, which is the least significant bit (LSB) is DSn[0] equal to Scrn[0]. The second bit, which is the most significant (MSB) bit is DSn[1] ...

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change: The first least significant bit (LSB) is DSn[0] equal to Scrn[0]. The second most significant (MSB) bit is DSn[1].

To: The first bit, which is the least significant bit (LSB), is DSn[0] equal to Scrn[0]. The second bit, which is the most significant (MSB) bit, is DSn[1] .

*Cl* **192** *SC* **192.3.2.2.17** *P* **185** *L* **35** # 72

Ran, Adee — Cisco Systems

*Comment Type* **T** *Comment Status* **A** *192_PCS*

Equations 192-6 and 192-7 defing A<sub>n</sub> and B<sub>n</sub>, which seem to apply only with tx_mode=SEND_N. Assuming that is the case, then there is no need to list tx_mode=SEND_N in their definitions (it raises the question what happens when the mode is different?)

*SuggestedRemedy*

Delete "tx_mode=SEND_N" and the opening brace in both equations

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

P185L32 add:

When tx_mode is not SEND_N PAM4 is not used.

*Cl* **192** *SC* **192.3.2.2.18** *P* **185** *L* **46** # 73

Ran, Adee — Cisco Systems

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

The initial value of the PRBS11 generator is not specified. I assume it can be any value except all zeros, as in the PRBS33 scramblers.

*SuggestedRemedy*

Indicate the reset conditions and requirements for the PRBS11 generator, as done in 192.3.2.2.19.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Insert, "The pattern generator is reset upon execution of the PCS Reset function. If PCS Reset is executed, all bits of the eleven-bit vector representing the scrambler state are arbitrarily set. The initialization of the scrambler state is left to the implementer. In no case, shall the scrambler state be initialized to all zeros." on P185, L45 before the sentence that starts, "This implements the generator polynomial."

Editorial license to add PICS.

*Cl* **192** *SC* **192.3.2.2.18** *P* **185** *L* **53** # 251

Steve, Gorshe — Microchip Technology

*Comment Type* **E** *Comment Status* **D** *scrambler*

Add clarification regarding when the PRBS11 runs.

*SuggestedRemedy*

While this is specified in 192.3.6.3, for consistency with 192.3.2.2.19, it would be good to add new text below Equation 192-8: "This scrambler, once started during PMA training, shall continue to run uninterrupted during the refresh headers of each frame and shall stop during the burst payload field and QUIET." Note that 192.3.6 also contains a statement similar to the one in 192.3.2.2.19.

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Insert the following text after the new text inserted by Comment #73:

"This scrambler, once started during PMA training, shall continue to run uninterrupted during the refresh headers of each frame and shall stop during the burst payload field and QUIET."

Editorial license to add PICS.

*Cl* **192** *SC* **192.3.2.2.19** *P* **186** *L* **20** # 128

de Koos, Andras — Microchip Technology

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

Though we've abandoned master/slave terminology in favour of Leader/Follower, Equations (192-9) and (192-10) still use "M/S".
Comment also applies to equation (191-8) in Section 191.4.2.2.16

*SuggestedRemedy*

Replace gM(x) and gS(s) with gL(X) and gF(x), respectively.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

In clause 192:
Replace gM(x) with gL(x) and replace gS(x) with gF(x) in Equations (192-9) and (192-10).

In clause 191:
Replace gM(x) and gS(x) with gD(x) for PHY_D and gS(x) for PHY_S.

*Cl* **192** *SC* **192.3.2.2.19** *P* **186** *L* **34** # 181

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

*Comment Type* **E** *Comment Status* **D** *Editorial*

unnecessary comma

*SuggestedRemedy*

Delete the comma after "In no case".

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

(Editor's note: Explicitly state as a requirement.)

Replace, "In no case, shall the scrambler state be initialized to all zeros."

with, "The scrambler state shall not be initialized to all zeros."

Editorial license granted to adjust PICS.

*Cl* **192** *SC* **192.3.2.2.19** *P* **187** *L* **1** # 74

Ran, Adee — Cisco Systems

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

Figure 192-11 shows two LFSR realizations which are conceptally similar to the PRBS11 generator in Figure 192-10, but the symbols used for the addition and the delay elements are different, the figure titles are different, and the scrambler in figure 192-11 has no explicit output (although in Figure 192-6 it is shown that it has three outputs, Scr<sub>n</sub> indexes 0, 3, and 8).

*SuggestedRemedy*

Change one of the figures (preferably figure 192-10) to be consistent with the other, especially the addition and delay elements.
Preferably, show the outputs of the LFSRs in Figure 192-11.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

License granted for Editor to work with TDD champion to modify Figure 192-10 for consistency with Figure 192-11 and to show LFSR outputs.

*Cl* **192** *SC* **192.3.2.2.22** *P* **188** *L* **20** # 384

Maguire, Valerie — Copperopolis; aff'l w/ CME Consulting, Microchip, and

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

Missing word

*SuggestedRemedy*

Change, "according to following mapping"

to, "according to the following mapping"

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by Comment #182.

*Cl* **192** *SC* **192.3.2.2.22** *P* **188** *L* **20** # 182

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

missing article

*SuggestedRemedy*

Change: according to following
To: according to the following

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.3.2.2.22** *P* **188** *L* **23** # 490

Zerna, Conrad — NXP

*Comment Type* **TR** *Comment Status* **A** *192_PCS*

PAM2 encoding is inconsistent with PAM4 encoding, which is problematic for refresh header versus payload.

*SuggestedRemedy*

Change line to:
Input bit Sn is mapped to the transmit symbol Tn as follows: if Sn = 0, then Tn = -1, if Sn = 1, then Tn = +1.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change line to:
Input bit Sn is mapped to the transmit symbol Tn as follows:

if Sn = 0, then Tn = -1, and
if Sn = 1, then Tn = +1.

*Cl* **192** *SC* **192.3.2.3** *P* **189** *L* **3** # 466

Law, David HPE

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

Figure 192-19 'RFER monitor block state diagram' uses the block_lock as an open arrow entry condition to the RFER_MT_INIT state, with subclause 192.3.5.1.2 'Variables' defining block_lock as a 'Boolean variable ...'. Further, subclause 192.3.6.1 Status 'Status' says the block_lock bit 'Indicates the state of the block_lock variable.'. Subclause 192.3.2.3 'PCS Receive function', however, describes when the 'block_lock flag is de-asserted' and when the '... block_lock flag is re-asserted ...'.

*SuggestedRemedy*

Either change all instances of '... block_lock flag ...' to '... block_lock variable ...' or to just '... block_lock ...' as is used elsewhere in subclause 192.3.2.3.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change all instances of "block_lock flag" to block_lock"

*Cl* **192** *SC* **192.3.2.3** *P* **189** *L* **4** # 340

Wang, Frank Realtek Semiconductor Corp.

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

there is a space between "hi" and "_rfer"

*SuggestedRemedy*

change "hi _rfer" to "hi_rfer"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.3.2.3.3** *P* **192** *L* **32** # 341

Wang, Frank Realtek Semiconductor Corp.

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

there is a space between "R_BLOCK_" and "TYPE"

*SuggestedRemedy*

change "R_BLOCK_ TYPE" to "R_BLOCK_TYPE"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.3.3** *P* **192** *L* **38** # 396

Maguire, Valerie Copperopolis; aff'l w/ CME Consulting, Microchip, and

*Comment Type* **T** *Comment Status* **R** *192_tests*

Should specifications for transmit and receive PCS test-pattern modes be written as "shall" statements, similar as to in clause 191.4.3?

*SuggestedRemedy*

Replace, "When the transmit PCS is operating in test-pattern mode, the input to the RS-FEC encoder (see Figure 192-5 or Figure 192-6) is set to zero and the initial condition of the PCS scrambler set to any non zero value."

with, "When the transmit PCS is operating in test-pattern mode, the input to the RS-FEC encoder (see Figure 192-5 or Figure 192-6) shall be set to zero and the initial condition of the PCS scrambler set to any non zero value."

Replace, "When the receiver PCS is operating in test-pattern mode, the received information is processed as shown in Figure 192-12 or Figure 192-13."

with, "When the receiver PCS is operating in test-pattern mode, the received information shall be processed as shown in Figure 192-12 or Figure 192-13."

Grant Editor's license to add PICS.

*Response* *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **192** *SC* **192.3.4** *P* **193** *L* **23** # 75

Ran, Adee Cisco Systems

*Comment Type* **E** *Comment Status* **A** *192_PCS*

The symbol S_t<sub>n</sub> is mixed typographic subscript and markup subscript. It is very unusual, and it makes it awkward to read and to refer to verbally (is it S-sub-t-sub-n?) I guess the "t" signifies that these are training symbols. But lowercase t usually stands for time.
Surely a simpler notation is possible.

*SuggestedRemedy*

In Figure 192-5 this symbol appears as the output of the "training payload generator" so I'd suggest labeling it TP<sub>n</sub>.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Globally replace, "S_t<sub>n" with "TF<sub>n"

where n is in subscript.

*Cl* **192** *SC* **192.3.4** *P* **196** *L* **3** # 252

Steve, Gorshe Microchip Technology

*Comment Type* **T** *Comment Status* **A** *192_PCS*

Add reference to new figure and table described in comment below.

*SuggestedRemedy*

Add new sentence to the end of the paragraph: "See Figure 192-hh and Table 192-hh for an illustration of the data burst payload structure."

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by Comment #254.

*Cl* **192** *SC* **192.3.4** *P* **196** *L* **26** # 253

Steve, Gorshe Microchip Technology

*Comment Type* **T** *Comment Status* **R** *192_PCS*

The data mode RS-FEC superframe only pertains to the HS, not the LS

*SuggestedRemedy*

As explained in 192.1, the HS TDD burst payload contains 25 RS-FEC superframes while the LS TDD burst payload contains a single RS-FEC superframe. Remove the 25-block structure from the data burst portion of the figure. A separate comment proposes a new figure and table to illustrate the data burst payload structure.

*Response* *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **192** *SC* **192.3.4** *P* **196** *L* **33** # 254

Steve, Gorshe Microchip Technology

*Comment Type* **T** *Comment Status* **A** *192_PCS*

Add new figure and table to illustrate the data burst payload structure.

*SuggestedRemedy*

Add new paragraph below Figure 192-18: "The burst payload structures are illustrated in Figure 192-hh, with the data burst payload information summarized in Table 192-h." Below this paragraph, insert the new figure and table from the attached file data_burst_format_fig_table.pdf

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Add new paragraph below Figure 192-18, "The burst payload structures are illustrated in Figure 192-hh. Data burst payload information is summarized in Table 192-h."

Insert the new figure and table from https://www.ieee802.org/3/dm/public/0726/data_burst_format_fig_table.pdf after the paragraph.

Editorial license to work with Steve G. to update table and figure for consistancy with the text as discussed during the meeting.

Editorial license granted to align figure and table with IEEE Style.

*Cl* **192** *SC* **192.3.4.1** *P* **196** *L* **36** # 127

de Koos, Andras Microchip Technology

*Comment Type* **E** *Comment Status* **A** *192_PCS*

It could be informative to note in this paragraph that the values in tables 192-7, 192-8, and 192-9 (symbols) are equivalent to the time values in Table 192-6

*SuggestedRemedy*

Add the an explicative note to the paragraph:
The durations (expressed in symbols) in the tables below match the durations (expressed in time) in Table 192-6.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Insert NOTE on P196L40:

NOTE - The durations for N<sub>r, N<sub>p, and N<sub>z (expressed in symbols) in the Table 192-7 and Table 192-8 correspond to the durations (expressed in ns) in Table 192-6.

where <sub> indicates a subscript.

*Cl* **192** *SC* **192.3.4.3** *P* **198** *L* **42** # 76

Ran, Adee Cisco Systems

*Comment Type* **T** *Comment Status* **A** *192_PCS*

The terms A<sub>n</sub> and G<sub>n</sub> are used in equation 192-13 without a defintion in the equation. A<sub>n</sub> is defined in equations 192-5 and 192-6, but I found only one other instance of G<sub>n</sub> (in Figure 191-9, another clause). I suspect that G<sub>n</sub> corresponds to G(n) defined in 192.3.2.2.20.

*SuggestedRemedy*

Add references to the definitions of these terms.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Insert the following variables before PAM2_Mapper:

A<sub>n is specified in 192.3.2.2.20
G<sub>n is the Gray-coded symbol specified in 192.3.2.2.20

Globally replace G(n) with G<sub>n

where n is in subscript.

*Cl* **192** *SC* **192.3.5.1.2** *P* **199** *L* **52** # 183

Wienckowski, Natalie IVN Solutions LLC; Ethernovia & Bosch

*Comment Type* **T** *Comment Status* **D** *192_PCS*

missing definition of when to set FALSE

*SuggestedRemedy*

Add to the end of the definition: It is set FALSE otherwise.
Also on P200L3, P200L11, and P200L15.

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Change the following definitions.

P199L52:
block_lock

Boolean variable that is set TRUE while the receiver is able to delineate the received burst payload boundaries. Otherwise set to FALSE.

P200L3:
hi_rfer

Boolean variable. See Figure 192-19. Set to TRUE when the received FEC frame uncorrectable error rate is high, and set to FALSE when the received FEC frame uncorrectable error rate is low.

P200L11:
pcs_reset

The pcs_reset parameter set by the PCS Reset function. It is TRUE for the duration of a PCS reset, and FALSE otherwise.

P200L15:
rf_valid

Boolean indication that is set TRUE if received Reed-Solomon frame is valid. A Reed-Solomon frame is valid if and only if all parity checks of the Reed-Solomon code are satisfied. rf_valid is set FALSE when an RS-FEC frame is received and is invalid.

*Cl* **192** *SC* **192.3.5.1.2** *P* **200** *L* **2** # 217

Slavick, Jeff — Broadcom

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

The definition of hi_rfer implies that it uses the rfer_timer, but Figure 192-19 appears to be controlling it.

*SuggestedRemedy*

Update the definition of hi_rfer to be "Boolean variable that is asserted TRUE when the rfer_cnt reaches 16 errors in one RFRX_CNT_LIMIT interval."

Delete the rfer_timer as it is not used.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by Comment #53

---

*Cl* **192** *SC* **192.3.5.1.2** *P* **200** *L* **2** # 53

Muma, Scott — Microchip

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

The definition of hi_rfer was copied from Clause 149 802.3-2022 but this was corrected in 802.3cy-2023 by changing 149.3.7.2.2. So update to match other corrections.

*SuggestedRemedy*

Change "rfer_timer" to "RFRX_CNT_LIMIT"

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **192** *SC* **192.3.5.1.2** *P* **200** *L* **6** # 467

Law, David — HPE

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

Subclause 192.3.5.1.2 'Variables' defines the pcs_data_mode variable with a cross-reference to 192.4.4.1, but then subclause 192.4.4.1 'State diagram variables' defines the pcs_data_mode variable with a cross-reference to 192.2.1.9.1. Suggest that the indirect cross-reference in subclause 192.3.5.1.2 be replaced with a direct cross-reference to 192.2.1.9.1.

*SuggestedRemedy*

Change 'See 192.4.4.1.' to read 'See 192.2.1.9.1'.

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **192** *SC* **192.3.5.1.3** *P* **200** *L* **46** # 397

Maguire, Valerie — Copperopolis; aff'l w/ CME Consulting, Microchip, and

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

Harmonize text for ENCODE (see P200,L52) and DECODE functions.

*SuggestedRemedy*

Replace, "The DECODE function shall decode the block based on code specified in 192.3.2.2.4."

with, "The DECODE function shall decode the block as specified in 192.3.2.2.4."

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **192** *SC* **192.3.5.2** *P* **205** *L* **31** # 468

Law, David — HPE

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

Move the transition condition 'R_TYPE(rx_coded) = T * R_TYPE_NEXT = (S + C)' to the right so it is clear that it is associated with the RX_D to RX_T transition in Figure 191-19 'PCS 64B/65B Receive state diagram'.

*SuggestedRemedy*

See comment.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

(Editor's note: Comment applies to Figure 192-21.)

Move the transition condition 'R_TYPE(rx_coded) = T * R_TYPE_NEXT = (S + C)' to the right so it is clear that it is associated with the RX_D to RX_T transition in Figure 192-21 'PCS 64B/65B Receive state diagram'.

*Cl* **192** *SC* **192.3.5.2** *P* **205** *L* **36** # 469

Law, David HPE

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

Move the transition condition 'R_TYPE(rx_coded) = T * R_TYPE_NEXT = (S + C)' to the right so it is clear that it is associated with the RX_E to RX_T transition in Figure 191-19 'PCS 64B/65B Receive state diagram'.

*SuggestedRemedy*

See comment.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

(Editor's note: Comment applies to Figure 192-21.)

Move the transition condition 'R_TYPE(rx_coded) = T * R_TYPE_NEXT = (S + C)' to the right so it is clear that it is associated with the RX_E to RX_T transition in Figure 192-21 'PCS 64B/65B Receive state diagram'.

*Cl* **192** *SC* **192.4.1** *P* **207** *L* **21** # 470

Law, David HPE

*Comment Type* **TR** *Comment Status* **D** *192_PHY_Cntrl*

Figure 192-22 'PMA reference diagram' shows the config variable sourced from the PHY CONTROL block and passed from the PMA to the PCS across the PMA service interface. Subclause 192.4.2.4 'PHY Control function' says that 'PHY Control shall comply with the state diagram in Figure 192-26.'.

Figure 192-26 'PHY Control state diagram', however, uses the config variable as an input, as part of the transition condition from the SILENT to TRAINING0 state. The config variable, therefore, is not sourced from the PHY CONTROL block as shown in Figure 192-22. Instead, both subclause 192.4.2.4.11 'Startup sequence' and subclause 192.2.1.2 'PMA_CONFIG.indication' say that the config variable is determined via management control or default hardware setup.

In addition, the PMA_CONFIG.indication primitive passes the config parameter from the PMA sublayer to the PCS; therefore, it seems odd to reference the PMA_CONFIG.indication config parameter in the PMA, since it is sourced there.

*SuggestedRemedy*

[1] Update figure 192-22 'PMA reference diagram' to [a] show a Configuration block that sources config and [b] show the config variable as an input to the PHY control block.

[2] Add a new PMA subclause as follows:

192.4.2.X PMA Configuration function

The PMA Configuration function sets the config variable to LEADER or FOLLOWER based on management control during initialisation or hardware setup.

[3] In subclause 192.4.4.1 'State diagram variables', change the definition of the config variable to read:

config
See 192.4.2.X.

[4] In subclause 192.4.2.4.11 'Startup sequence', delete the text 'PMA_CONFIG is predetermined to be the LEADER or FOLLOWER ...' since this is now addressed in the new 192.4.2.X 'PMA Configuration function' subclause.

[5] In subclause 192.4.2.2 'PMA Transmit function' change the text 'When the PMA_CONFIG.indication parameter config is LEADER, the ...' to read 'When the config variable (see 192.4.2.X) is set to LEADER, the ...' and change the text 'If the PMA_CONFIG.indication parameter config is FOLLOWER, the PMA Transmit function ...' to read 'When the config variable is set to FOLLOWER, the PMA Transmit function ...'.

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

(Editor's note: This is a carry-over issue from clauses 149 and 165.)

License granted for the Editor to work with the TD champion to define config as a variable for the PMA and PCS that is set according to the value of register bit 1.2100.14, and pull config out of the PMA interface since it's really a static management/config setting not a PMA->PCS signal.

Editorial license granted to update diagrams, etc. affected by this change.

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*Cl* **192** *SC* **192.4.2.3** *P* **208** *L* **49** # 190

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

There is only one function listed.

*SuggestedRemedy*

Change: include the functions of
To: include the function of

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **192** *SC* **192.4.2.3** *P* **209** *L* **8** # 191

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

missing article

*SuggestedRemedy*

Add "the" between "receive" and "link".

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **192** *SC* **192.4.2.4.3** *P* **210** *L* **28** # 192

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

Add non-breaking spaces between every three digits to make the number easier to read per IEEE Style Manual

*SuggestedRemedy*

Change: 16776959
To: 16 776 959

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **192** *SC* **192.4.2.4.4** *P* **210** *L* **45** # 398

Maguire, Valerie — Copperopolis; aff'l w/ CME Consulting, Microchip, and

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

If values are not transmitted, then they are not available to be ignored.

*SuggestedRemedy*

Replace, "Any other values shall not be transmitted and shall be ignored at the receiver."

with, "Any other values shall not be transmitted."

Grant Editor's license to adjust PICS.

*Response* *Response Status* **Z**

REJECT.

This comment was WITHDRAWN by the commenter.

---

*Cl* **192** *SC* **192.4.2.4.4** *P* **210** *L* **47** # 193

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

The rest of the paragraph uses "Message Field", but it is "Message Fields" in one spot for no apparent reason.

*SuggestedRemedy*

Change: Message Fields
To: Message Field

*Response* *Response Status* **C**

ACCEPT.

---

*Cl* **192** *SC* **192.4.2.4.4** *P* **210** *L* **48** # 399

Maguire, Valerie — Copperopolis; aff'l w/ CME Consulting, Microchip, and

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

Typo

*SuggestedRemedy*

Replace, "Message Fields setting"

with, "Message Field setting"

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by Comment #193.

*Cl* **192** *SC* **192.4.2.4.5** *P* **212** *L* **16** # 40

Muma, Scott — Microchip

*Comment Type* **T** *Comment Status* **D** *192_PHY_Cntrl*

The HS Rate fields could better align with the registers 1.2318 and 1.2320 in Clause 45 and the negotiated rate field by leaving a gap between 10G and 5G.

*SuggestedRemedy*

In Table 192-11 swap 10 Gb/s and Reserved between bit 5 and bit 4 in both Octet 9 and Octet 10.
In Table 192-12 swap 10Gb/s and Reserved between row 000100 and 001000.

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT.

*Cl* **192** *SC* **192.4.2.4.5** *P* **212** *L* **33** # 194

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

It should be HS_RX, HS_TX, LS_RX, and LS_TX based on the Nomenclature in 192.1.1

*SuggestedRemedy*

Add missing "_" in four places in this paragraph.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.4.2.4.5** *P* **212** *L* **44** # 54

Muma, Scott — Microchip

*Comment Type* **E** *Comment Status* **D** *192_PHY_Cntrl*

Their can be multiple rates supported, so instead of 0's for the rows that have a 1 bit there should be x's.

*SuggestedRemedy*

In Table 192-12 in LS rate change 01 to x1, change 10 to 1x, delete the row with 11.
In HS rate change:
000001 to xxxxx1
000010 to xxxx1x
000100 to xxx1xx
001000 to xx1xxx
010000 to x1xxxx
100000 to 1xxxxx

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT.

*Cl* **192** *SC* **192.4.2.4.6** *P* **213** *L* **40** # 195

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

missing article and comma

*SuggestedRemedy*

Change: contains TDD delay counter sent LSB first.
To: contains the TDD delay counter, sent LSB first.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.4.2.4.6** *P* **214** *L* **19** # 449

Ganesan, Aravind — Texas Instruments

*Comment Type* **TR** *Comment Status* **D** *192_PHY_Cntrl*

It is not clear how the link segment delay maps to the delay count in the TDD delay counter. the link segment delay could also have some slow variation over time due to temperature drift.

*SuggestedRemedy*

A clarification in this section will help avoid ambiguity in implementation.

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Insert, "The TDD delay counter may be calculated as the estimated link segment delay in symbol times (at the 3 Gbd rate) divided by 16, then rounded to the nearest integer." after ".. delay_count_valid bit to 1." on P214, L21

*Cl* **192** *SC* **192.4.2.4.6** *P* **214** *L* **20** # 196

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

*Comment Type* **T** *Comment Status* **D** *192_PHY_Cntrl*

The "should" should be "shall. Is it okay if the LEADER doesn't estimate the link segment delay? Can it just guess or pick a random value?

*SuggestedRemedy*

Change: it should estimate the link segment delay
To: it shall estimate the link segment delay

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

(Editor's note: The observable behavior is setting the delay_count and setting the delay_count_valid.)

Replace, "After the LEADER detects the FOLLOWER TDD burst position, it should estimate the link segment delay, then set its delay_count in the TDD delay counter to a value between 0 to 63, as well as set delay_count_valid bit to 1."

With, "After the LEADER detects the FOLLOWER TDD burst position and estimates the link segment delay, it shall set its delay_count in the TDD delay counter to a value between 0 to 63, as well as set delay_count_valid bit to one."

Grant Editorial license to add supporting PICS.

*Cl* **192** *SC* **192.4.2.4.7** *P* **214** *L* **37** # 342

Wang, Frank — Realtek Semiconductor Corp.

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

insert a comma after "Oct9<7:0>"

*SuggestedRemedy*

change "[Oct8<7:0>, Oct9<7:0> Oct10<7:0>]" to "[Oct8<7:0>, Oct9<7:0>, Oct10<7:0>]"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.4.2.4.7** *P* **214** *L* **39** # 197

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

capitalization

*SuggestedRemedy*

Change: Data mode
To: data mode

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.4.2.4.7** *P* **214** *L* **214** # 388

Maguire, Valerie — Copperopolis; aff'l w/ CME Consulting, Microchip, and

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

"will be" seems to imply something in the future and I don't think this is what's intended.

*SuggestedRemedy*

Change "will be" to "is"

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change "will be" to "may be"

*Cl* **192** *SC* **192.4.2.4.8** *P* **214** *L* **51** # 343

Wang, Frank — Realtek Semiconductor Corp.

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

insert a comma after "Oct9<7:0>" and remove the right round bracket after "Oct10<7:0>"

*SuggestedRemedy*

change "[Oct8<7:0>, Oct9<7:0> Oct10<7:0>)]" to "[Oct8<7:0>, Oct9<7:0>, Oct10<7:0>]"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.4.2.4.9** *P* **215** *L* **5** # 400

Maguire, Valerie — Copperopolis; aff'l w/ CME Consulting, Microchip, and

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

There seems to be a comma missing and this sentence could be written more clearly.

*SuggestedRemedy*

Replace, "In Figure 192-25 the 16 delay elements S0,..., S15, shall be initialized to zero."

with, "The 16 delay elements, S0,..., S15, shall be initialized to zero as shown in Figure 192-25."

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace, "In Figure 192-25 the 16 delay elements S0,..., S15, shall be initialized to zero."

with, "The 16 delay elements shown in Figure 192-25 shall be initialized to zero." and move this to be the last sentence in the paragraph.

Editorial license granted to adjust PICS accordingly.

*Cl* **192** *SC* **192.4.2.4.11** *P* **216** *L* **3** # 198

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

verb tense

*SuggestedRemedy*

Change: arrived at the FOLLOWER
To: arrives at the FOLLOWER

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

Replace, "...the transmit MDI shall be aligned so that it is 400 ± 1 transmit symbols after the last PMA training payload symbol from the LEADER arrived at the FOLLOWER input MDI."

with, "...the transmit MDI shall be aligned so that it is 400 ± 1 transmit symbols after the arrival of the last PMA training payload symbol from the LEADER at the FOLLOWER input MDI."

*Cl* **192** *SC* **192.4.2.4.11** *P* **216** *L* **13** # 199

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

How are you "at" a state? It should be during, e.g. while in the state.

*SuggestedRemedy*

Change: At any
To: During any

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

(Editor's note: Could be written more clearly. Also missing a "then" to complete the condition.")

Replace, "At any COUNTDOWN or PCS_TEST state, if the local receiver status (indicated by loc_rcvr_status)
transitions to NOT_OK, PHY Control returns to the SILENT state and attempts a retrain."

with, "If the local receiver status (indicated by loc_rcvr_status) transitions to NOT_OK during any COUNTDOWN or PCS_TEST state, then PHY Control returns to the SILENT state and attempts a retrain."

*Cl* **192** *SC* **192.4.2.4.11** *P* **216** *L* **17** # 344

Wang, Frank — Realtek Semiconductor Corp.

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

change hyphen to en-dash

*SuggestedRemedy*

change "176 ns - delay_count" to "176 ns - delay_count"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.4.2.4.11** *P* **216** *L* **22** # 200

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

missing article

*SuggestedRemedy*

Change: within maximum time
To: within the maximum time

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

(Editor's note: This sentence contains two thoughts and the grammar is incorrect. Also, "allowed" should not be deleted.)

Replace, "The link_fail_inhibit_timer value is defined to be 97.5 ms, it is used to force a restart if the link up cannot be achieved within maximum allowed time."

with, "The link_fail_inhibit_timer value is defined to be 97.5 ms. It is used to force a restart if the link up cannot be achieved within the maximum allowed time."

*Cl* **192** *SC* **192.4.2.5** *P* **216** *L* **42** # 345

Wang, Frank — Realtek Semiconductor Corp.

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

wording

*SuggestedRemedy*

change "pcs_data_mode=TRUE" to "pcs_data_mode = TRUE"
and
change "link_ status" to "link_status"

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.4.2.6** *P* **216** *L* **49** # 471

Law, David — HPE

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

Subclause 192.4.2.6 'Clock Recovery function' says, 'The received clock signal is supplied to the PMA Transmit function by received_clock for use when configured as the FOLLOWER. Figure 192-22 'PMA reference diagram', however, shows the recovered_clock supplied to the PMA transmit function with the note 'The recovered_clock arc is shown to indicate delivery of the received clock signal back the PMA TRANSMIT for loop timing.'. In addition, subclause 192.4.2.2 'PMA Transmit function' says 'If the ... config is FOLLOWER, the PMA Transmit function shall source TX_TCLK from the recovered clock of 192.4.2.6 ...'. In addition, suggest clarifying that the config variable determines when the function is configured as FOLLOWER.

*SuggestedRemedy*

Suggest that the text 'The received clock signal is supplied to the PMA Transmit function by received_clock for use when configured as the FOLLOWER.' should be changed to read 'The received clock signal is supplied to the PMA Transmit function by recovered_clock for use when the config variable is set to FOLLOWER.'.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.4.4.1** *P* **219** *L* **28** # 201

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

Change 01 value text to be parallel to 00 value text.

*SuggestedRemedy*

Change: PHY Control is currently in asymmetric training.
To: PHY Control is currently in an asymmetric training phase.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.4.4.2** *P* **219** *L* **35** # 203

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

Removed redundant statement. This is already stated in 191.2.7.

*SuggestedRemedy*

Delete: All timers operate in the manner described in 14.2.3.2.

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.4.4.2** *P* **219** *L* **38** # 346

Wang, Frank — Realtek Semiconductor Corp.

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

When training_active = TRUE, the time for "link_fail_inhibit_timer" stays in the SILENT state should also be considered. Therefore, the description of link_fail_inhibit_timer can be rewritten as proposed change for simplicity.

*SuggestedRemedy*

change:
"A timer used to determine the maximum amount of time the PHY Control stays in the TRAINING, COUNTDOWN, and PCS_TEST states."
to:
"A timer used to determine the maximum amount of time the PHY Control sets training_active = TRUE."

*Response* *Response Status* **W**

ACCEPT.

---

*Cl* **192** *SC* **192.4.5** *P* **220** *L* **20** # 347

Wang, Frank — Realtek Semiconductor Corp.

*Comment Type* **TR** *Comment Status* **D** *192_link_mon*

link_fail_inhibit_timer_done should only be valid when training_active = TRUE. Therefore, the condition for SILENT to DT needs update to avoid possible deadlock.

*SuggestedRemedy*

change one of the output conditions of SILENT state, "link_fail_inhibit_timer_done", to "link_fail_inhibit_timer_done * training_active".

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT.

---

*Cl* **192** *SC* **192.4.5** *P* **220** *L* **24** # 348

Wang, Frank — Realtek Semiconductor Corp.

*Comment Type* **TR** *Comment Status* **D** *192_link_mon*

rem_countdown_done has a similar definition as loc_countdown_done. As the description in 192.4.4.1, both are set to FALSE when entering to a TRAINING state. If "loc_countdown_done <= FALSE" is included in TRAINING0 and TRAINING1 of PHY Control state diagram, "rem_countdown_done <= FALSE" should also be included.

*SuggestedRemedy*

Add "rem_countdown_done <= FALSE" to TRAINING0 and TRAINING1 states.

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT.

---

*Cl* **192** *SC* **192.4.5** *P* **221** *L* **36** # 472

Law, David — HPE

*Comment Type* **TR** *Comment Status* **D** *192_link_mon*

Figure 192-27 'PHY Control state diagram' in the PMA uses the hi_rfer and block_lock variables, yet these variables are not defined in subclause 192.4.4.1 'State diagram variables'. The hi_rfer and block_lock variables are generated in the PCS, with the hi_rfer variable generated in Figure 192-19 'RFER monitor state diagram', and the block_lock generated in subclause 192.3.2.3 PCS 'Receive function'. As a result, these variables pass across the PMA Service interface, yet they are not parameters of any of the primitives defined in subclause 192.2.1 'PMA service interface'. Further, they are not illustrated in Figure 192-3 'MultiGBASE-A service interface', Figure 192-4 'PCS reference diagram', or Figure 192-22 'PMA reference diagram'.

*SuggestedRemedy*

[1] Add the following to the list of primitives in subclause 192.2.1 'PMA service interface':

PMA_PCSSYNC.request(block_lock, rfer_cnt)

[2] Add an arrow labelled 'PMA_PCSSYNC.request' from the PHY_S PCS to PHY_S PMA block in Figure 191-5 'PHY_S service interfaces' in Figure 191-5 'PHY_S service interfaces' and Figure 191-6 'PHY_D service interfaces'.

[3] Add the following new subclauses to subclause 192.2.1:

192.2.1.X PMA_PCSSYNC.request

192.2.1.X.1 Semantics of the primitive

PMA_PCSSYNC.request(block_lock, rfer_cnt)

The PMA_PCSSYNC.request primitive passes the block_lock and rfer_cnt parameters from the PCS to the PMA.

The parameter block_lock can take on one of the following two values of the form:

TRUE The PCS Synchronization process has acquired block delineation.
FALSE The PCS Synchronization process has not acquired block delineation.

The parameter rfer_cnt can take on one of the following two values of the form:

TRUE The PCS Synchronization has detected 16 errors in one RFRX_CNT_LIMIT interval.
FALSE The PCS Synchronization has not detected 16 errors in one RFRX_CNT_LIMIT interval.

192.2.1.X.2 When generated

The PCS generates PMA_PCSSYNC.request messages to indicate a change in block_lock or rfer_cnt.

192.2.1.X.3 Effect of receipt

The effect of receipt of this primitive is specified in Figure 191-31.

[4] Add block_lock and rfer_cnt to figures 192-3, 192-4, and 192-22.

[5] Add the following variables to subclause 192.4.4.1 'State diagram variables':

block_lock

Boolean variable that is set TRUE by the PCS Synchronization process when it acquires block delineation. It is passed to the PMA via the block_lock parameter of the PMA_PCSSYNC.request primitive.

hi_rfer
Boolean variable that is set TRUE by the PCS Synchronization process when the rfer_cnt reaches 16 errors in one RFRX_CNT_LIMIT interval. It is passed to the PMA via the rfer_cnt parameter of the PMA_PCSSYNC.request primitive.

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

(Editor's note: This is a carry-over issue from clauses 149 and 165. Some figure references in the comment referred to clause 191 and needed to be corrected.)

Grant editorial license to implement the following changes with any necessary style or other adjustments needed in case of reference or other inconsistencies:

[1] Add the following to the list of primitives in subclause 192.2.1 'PMA service interface':

PMA_PCSSYNC.request(block_lock, rfer_cnt)

[2] Add an arrow labelled 'PMA_PCSSYNC.request' from the PHY_S PCS to PHY_S PMA block in Figure 192-3 'PHY_S service interfaces' in Figure 192-3 'PHY_S service interfaces' and Figure 192-3 'PHY_D service interfaces'.

[3] Add the following new subclauses to subclause 192.2.1:

192.2.1.X PMA_PCSSYNC.request

192.2.1.X.1 Semantics of the primitive

PMA_PCSSYNC.request(block_lock, rfer_cnt)

The PMA_PCSSYNC.request primitive passes the block_lock and rfer_cnt parameters from the PCS to the PMA.

The parameter block_lock can take on one of the following two values of the form:

TRUE The PCS Synchronization process has acquired block delineation.
FALSE The PCS Synchronization process has not acquired block delineation.

The parameter rfer_cnt can take on one of the following two values of the form:

TRUE The PCS Synchronization has detected 16 errors in one RFRX_CNT_LIMIT interval.
FALSE The PCS Synchronization has not detected 16 errors in one RFRX_CNT_LIMIT interval.

192.2.1.X.2 When generated

The PCS generates PMA_PCSSYNC.request messages to indicate a change in block_lock or rfer_cnt.

192.2.1.X.3 Effect of receipt

The effect of receipt of this primitive is specified in Figures 192-27 and 192-28.

[4] Add block_lock and rfer_cnt to figures 192-3, 192-4, and 192-22.

[5] Add the following variables to subclause 192.4.4.1 'State diagram variables':

block_lock

Boolean variable that is set TRUE by the PCS Synchronization process when it acquires block delineation. It is passed to the PMA via the block_lock parameter of the PMA_PCSSYNC.request primitive.

hi_rfer
Boolean variable that is set TRUE by the PCS Synchronization process when the rfer_cnt reaches 16 errors in one RFRX_CNT_LIMIT interval. It is passed to the PMA via the rfer_cnt parameter of the PMA_PCSSYNC.request primitive.

*Cl* **192** *SC* **192.5.1** *P* **223** *L* **23** # 349

Wang, Frank — Realtek Semiconductor Corp.

*Comment Type* **TR** *Comment Status* **D** *192_tests*

10 Gb/s PHY transmits PAM4 for test mode 4, not PAM2.

*SuggestedRemedy*

change:
"PHYs that support 5 Gb/s and 10 Gb/s transmit rates shall support transmission of this signal at 6 GBd."
to:
"PHYs that support 5 Gb/s transmit rate shall support transmission of this signal at 6 GBd."

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

TFTD

(Editor's note: 10G PHYS also use PAM2 transmission at 6GBd, so for a 10G PHY is it useful to test in both PAM2 and PAM4 at 6Gbd? An "a" or a "the" now seems appropriate before 5 Gb/s transmit rate.)

Change:
"PHYs that support 5 Gb/s and 10 Gb/s transmit rates shall support transmission of this signal at 6 GBd."
to:
"PHYs that support a 5 Gb/s transmit rate shall support transmission of this signal at 6 GBd."

Grant Editorial license to adjust PICS, if necessary.

*Cl* **192** *SC* **192.5.1.1** *P* **224** *L* **17** # 350

Wang, Frank — Realtek Semiconductor Corp.

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

Test mode 4 in clause 192 is "transmitter distortion test", not "transmitter linearity test".

*SuggestedRemedy*

change "transmitter linearity" to "transmitter distortion".
Do the same implementation for line 13 of page 225 (Figure 192-31).

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.5.2** *P* **225** *L* **20** # 351

Wang, Frank — Realtek Semiconductor Corp.

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

to align with 802.3ch, change "ac" to "AC" and change "dc" to "DC".

*SuggestedRemedy*

line 21: change "ac-coupled" to "AC-coupled"; change "dc" to "DC".
line 22: change "ac-coupling" to "AC-coupling".

*Response* *Response Status* **C**

REJECT.

Per guidance from Pete Anslow, ac and dc are correct. "AC" and "DC" should only be used when the acronym is the start of the sentence.

*Cl* **192** *SC* **192.5.2.2** *P* **225** *L* **43** # 204

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

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

improve wording

*SuggestedRemedy*

Change: The captured block of signal shall be at least 4000 transmitted symbols long and be sampled with the minimum 10x oversampling. The transmit baud rate may be reduced to 1 Gs/s by repeating the symbols using the same
clock edge as in data mode of operation.
To: The captured block of signala shall be at least 4000 transmitted symbols long and be sampled with a minimum of 10x oversampling. The transmit baud rate may be reduced to 1 Gs/s by repeating the symbols using the same
clock edge as in the data mode of operation.

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

(Editor's note: Fixed a typo in the suggested remedy.)

Change: The captured block of signal shall be at least 4000 transmitted symbols long and be sampled with the minimum 10x oversampling. The transmit baud rate may be reduced to 1 Gs/s by repeating the symbols using the same clock edge as in data mode of operation.

To: The captured block of signals shall be at least 4000 transmitted symbols long and be sampled with a minimum of 10x oversampling. The transmit baud rate may be reduced to 1 Gs/s by repeating the symbols using the same clock edge as in the data mode of operation.

*Cl* **192** *SC* **192.5.2.3** *P* **227** *L* **13** # 352

Wang, Frank — Realtek Semiconductor Corp.

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

typo: remove"/"

*SuggestedRemedy*

change "5 Gb/s/" to "5 Gb/s".

*Response* *Response Status* **C**

ACCEPT.

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*Cl* **192** *SC* **192.5.2.4** *P* **227** *L* **26** # 359

Seth, Sumantra — Texas Instruments

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

Table 192-19 power leves are higher than Table 191-16 power level.

*SuggestedRemedy*

Should have Same power level between Table 192-19 and Table 191-16

*Response* *Response Status* **W**

REJECT.

The CRG disagrees with the commenter. Clause 191 and Clause 192 specify different PHYs with no requirement to use the same power levels.

---

*Cl* **192** *SC* **192.5.2.4** *P* **227** *L* **36** # 360

Seth, Sumantra — Texas Instruments

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

Differential (Balanced) and Single Ended (Unbalanced)

*SuggestedRemedy*

Differential (Balanced) and Single Ended (Unbalanced) should be replaced as T1-MDI and V1-MDI to be consistent across tables.

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

In Table 192-19,

Replace, "Differential (Balanced)"

with, "MDI, -T1"

Replace, "Single-ended (unbalanced)"

with, "MDI, -V1"

---

*Cl* **192** *SC* **192.5.2.4** *P* **228** *L* **15** # 83

Lusted, Kent — Synopsys

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

The abbreviation "UPSD" is not intuitively obvious to the average reader.

*SuggestedRemedy*

Change "UPSD" to "Upper PSD"

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Replace, "...shall be between the upper and lower masks specified in Equation (192-17) and Equation (192-18)."

with, "shall be between the upper PSD mask specified in Equation (192-17) and the lower PSD mask specified in Equation (192-18)."

Replace, "UPSD" with "UpperPSD" in Equation (192-17).

Replace, "LPSD" with "LowerPSD" in Equation (192-18).

---

*Cl* **192** *SC* **192.5.2.4** *P* **228** *L* **24** # 84

Lusted, Kent — Synopsys

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

The abbreviation "LPSD" is not intuitively obvious to the average reader.

*SuggestedRemedy*

Change "LPSD" to "Lower PSD"

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Accommodated by Comment #83.

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*Cl* **192** *SC* **192.5.2.6** *P* **230** *L* **25** # 392

Maguire, Valerie — Copperopolis; aff'l w/ CME Consulting, Microchip, and

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

Typo - ")" not required

*SuggestedRemedy*

Replace, "1 ppm/sec)."

with, "1 ppm/sec."

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.7.1.3** *P* **233** *L* **12** # 353

Wang, Frank — Realtek Semiconductor Corp.

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

change angle brackets to round brackets.

*SuggestedRemedy*

change "<" to "(" and change ">" to ")".
Do the same for Equation (192-26).

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.7.1.5** *P* **233** *L* **53** # 29

Bergner, Bert — TE Connectivity

*Comment Type* **T** *Comment Status* **D** *192_Lnk_Seg*

Screening attenuation refers to SC 149.7.1.5. This subclause defines screening attenuation with 45dB from 30MHz up to Fmax. Fmax depends on speed grade in Clause 149. Thus, we inherit the speed grade dependency from Clause 149 which will differentiate between 2.5G, 5G and 10G. This conflicts with the idea of screening and coupling attenuation in 192 to be independend of speed grade.

*SuggestedRemedy*

Change the sentens to " The screening attenuation of each -T1 link shall be as specified in 149.7.5.1 with Fmax = 5000 MHz."

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

TFTD

(Editor's note: "segment" was dropped from the comment. A "," seems missing.)

Replace, "The screening attenuation of a -T1 link segment shall be as specified in 149.7.1.5.

with, "The screening attenuation of a -T1 link segment shall be as specified in 149.7.1.5, with Fmax = 5000 MHz."

Grant Editorial license to adjust PICS as necessary.

*Cl* **192** *SC* **192.7.1.6** *P* **234** *L* **3** # 205

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

*Comment Type* **T** *Comment Status* **D** *192_Lnk_Seg*

Why is the frequency range for the maximum link delay different from the frequency range for IL and RL?

*SuggestedRemedy*

Change: between 3 MHz and 4 GHz.
To: between 10 MHz and 5 GHz.

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT.

*Cl* **192** *SC* **192.7.2.1** *P* **234** *L* **22** # 354

Wang, Frank — Realtek Semiconductor Corp.

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

formatting

*SuggestedRemedy*

The variables (f, j, and m) in (192-21) should be italic.
Do the same for Equations (192-23), (192-28), and (192-30).

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.7.2.2** *P* **235** *L* **40** # 355

Wang, Frank — Realtek Semiconductor Corp.

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

formatting: the second "f" in line 40 should be italic.

*SuggestedRemedy*

change "f" to "f".

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.8.1.5** *P* **239** *L* **3** # 136

Long, Richard — TE Connectivity

*Comment Type* **TR** *Comment Status* **D** *192_Lnk_Seg*

Screening attenuation limits need to be changed

*SuggestedRemedy*

The screening attenuation of a -V1 link segment shall meet the values determined using Equation (191-19). Screening attenuation is tested as specified in IEC 62153-4-7 using triaxial tube-in-tube method. Additional screening attenuation test methodologies are defined in Annex 149A. These methodologies shall be applied with adaptation to unbalanced coaxial cabling. (See Bergner contribution from June 16 Ad Hoc)

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Accommodated by Comments #34 and #30.

*Cl* **192** *SC* **192.8.1.5** *P* **239** *L* **4** # 34

Bergner, Bert — TE Connectivity

*Comment Type* **T** *Comment Status* **D** *192_Lnk_Seg*

Screening attenuation for -V1 coaxial unbalanced link segment: The sentence "Additional screening attenuation test methodologies are defined in Annex 149A." takes reference to clause 149A which defines screening attenuation measurement specifically for balanced link segments only. This may cause confusion.

*SuggestedRemedy*

Change the sentence to "The additional screening attenuation test methodologies defined in Annex 149A shall be applied with adaptation to unbalanced coaxial cabling."

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

TFTD

(Editor's note: A contribution addressing -V1 screening attenuation final test methods is expected.)

Delete, "Additional screening attenuation test methodologies are defined in Annex 149A." and replace with new text pending contribution

Editorial license granted to align PICS.

*Cl* **192** *SC* **192.8.1.5** *P* **239** *L* **7** # 30

Bergner, Bert — TE Connectivity

*Comment Type* **T** *Comment Status* **D** *192_Lnk_Seg*

Screening attenuation for clause 192 -V1 link segments is defined by (192-27) with 64dB up to 3GHz and 54dB up to 5GHz. The link segment contains cable and connectors.The USCAR-49 defines screening attenuation for a single connector only with 62dB up to 2GHz which is less than the 192 -V1 link segment. USCAR-49 is considered as state of the art definition of automotive grade coaxial connectors. Thus, the 802.3dm objective "Define ... link segments suitable for use with ... automotive unbalanced coaxial cabling supporting use of up to 4 inline connectors ..." cannot be fulfilled.

*SuggestedRemedy*

Change screening attenuation requirments for 192.8.1.5 in equation (192-27) to same value as in 191.10.1.5 (equation (191-19)).

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

TFTD

*Cl* **192** *SC* **192.8.1.6** *P* **239** *L* **42** # 206

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

*Comment Type* **T** *Comment Status* **D** *192_Lnk_Seg*

Why is the frequency range for the maximum link delay different from the frequency range for IL and RL?

*SuggestedRemedy*

Change: between 3 MHz and 4 GHz.
To: between 10 MHz and 5 GHz.

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT.

*Cl* **192** *SC* **192.8.2** *P* **239** *L* **50** # 35

Bergner, Bert — TE Connectivity

*Comment Type* **T** *Comment Status* **D** *192_Lnk_Seg*

Coupling parameters for -V1 coaxial link segments: The sentence "Test methodologies are specified in Annex 97B." refers to Annex 97B which specifically describes cross talk measurements for balanced cabling. Especially the description in 97A "Link segment ends not under test are terminated in 100 Ohm differential mode and 200 Ohm common mode." and Figure 97B-1 may cause confusion.

*SuggestedRemedy*

Change the sentence to "Test methodologies are specified in Annex 97B and shall be applied with adaptation to unbalanced coaxial cabling."

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

TFTD. Resolve after Comment #34.

(Editor's note: A contribution addressing -V1 screening attenuation final test methods is expected.)

Delete, "The test methodologies are specified in Annex 97B." and replace with new text pending contribution

Editorial license granted to align PICS.

*Cl* **192** *SC* **192.8.2.2** *P* **241** *L* **17** # 356

Wang, Frank — Realtek Semiconductor Corp.

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

formatting: the second "f" in line 17 should be italic.

*SuggestedRemedy*

change "f" to "f".

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.9.2.1** *P* **243** *L* **5** # 391

Maguire, Valerie — Copperopolis; aff'l w/ CME Consulting, Microchip, and

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

Typo - "is" not required

*SuggestedRemedy*

Replace, "a nominal differential characteristic is impedance of..."

with, "a nominal differential characteristic impedance of..."

*Response* *Response Status* **C**

ACCEPT.

*Cl* **192** *SC* **192.9.2.1** *P* **243** *L* **21** # 207

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

*Comment Type* **T** *Comment Status* **D** *192_Lnk_Seg*

Why is the maximum MDI RL frequency less than the link segment RL frequency? I think is left from before the link segment requirements were finalized.

*SuggestedRemedy*

Change: 4000
To: 5000 for 5 Gb/s and 10 Gb/s

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

TFTD

*Cl* **192** *SC* **192.10.2.1** *P* **244** *L* **36** # 208

Wienckowski, Natalie — IVN Solutions LLC; Ethernovia & Bosch

*Comment Type* **T** *Comment Status* **D** *192_Lnk_Seg*

Why is the maximum MDI RL frequency less than the link segment RL frequency? I think is left from before the link segment requirements were finalized.

*SuggestedRemedy*

Change: 4000
To: 5000 for 5 Gb/s and 10 Gb/s

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

TFTD

*Cl* **192** *SC* **192.12** *P* **246** *L* **40** # 121

Kim, Yong — General Motors

*Comment Type* **TR** *Comment Status* **D** *192_delay*

Pause (CL31 and Annex 31B) operation seem irrelvant to camear and display application that these asymetric PHYs are defined to be used. This said, 31.B.4.3, Pg 6383 on 802.3-2022 edition, refers to 31.B.3.7 that says "Stations that do not implement an exposed MII, shall measure this time at the MDI, with the timing specification increased to one pause_quantum + 64 BT." This project has 100 Mbps that does not have exposed MII, the timeing is increasd by 64 BT. this conflcts with "The sum of the transmit and receive data delays for an implementation of the PHY shall not exceed the limits shown in Table 192-24." in CL192.12, pg 247 line 1.

*SuggestedRemedy*

Select which one is correct, i.e. pause quanta with our without +64 BT, and revise the text to match.

*Proposed Response* *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

TFTD

(Editor's note: 192.12 addresses the transmit+receive delay in one direction between 2 different devices (i.e., Tx XGMII->MDI, Tx->MDI, Rx->Rx XGMII) so only one speed is involved. The limit in Annex 31B is from an Rx MDI->Rx XGMII->MAC Control->TX MAC->Tx XGMII->Tx MDI, which is all within a single device. In this case, there are 2 different speeds involved and application of the limits in Annex 31B is unclear. It may reduce confusion if the system uses the delay limits in 192.12, as well as updated limits for asymmetric links added to 31B.4.6. Note the time for 2.5G is only 6 pause_quanta, which is not met by many clauses.)

Grant Editor license to work with TDD champion to bring appropriate sections of Annex 31B (e.g., text and PICS) into the draft and add limits for the Clause 192 PHY.

Consider whether any updates are needed based on Clause 191 as well.

*Cl* **192** *SC* **192.12** *P* **247** *L* **10** # 383

Maguire, Valerie — Copperopolis; aff'l w/ CME Consulting, Microchip, and

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

Make adjustments to Table 192-24 and Table 191-24 to align with Table 81-1 and make minor editorial adjustments.

*SuggestedRemedy*

In Table 192-24 and Table 191-24,

Change table title from "Delay Limits" to "Delay constraints"

Change "Bit times" column header to "Maximum bit time (BT)"

Change "Pause quanta" column header to "Maximum pause_quanta"

Change "Delay (ns)" to "Maximum delay (ns)"

*Response* *Response Status* **C**

ACCEPT IN PRINCIPLE.

In Table 192-24 and Table 191-24,

Change table title from "Delay Limits" to "Delay constraints"

Change "Bit times" column header to "Maximum delay (BT)"

Change "Pause quanta" column header to "Maximum delay (pause_quanta)"

Change "Delay (ns)" to "Maximum delay (ns)"

*Cl* **192** *SC* **192.13** *P* **249** *L* **4** # 85

Lusted, Kent — Synopsys

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

PICS entries for 192.13.3, 192.13.4.1, and 192.13.4.2 are incomplete

*SuggestedRemedy*

Complete PIC entries

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Accommodated by Comment #448.

*Cl* **192** *SC* **192.13.3** *P* **248** *L* **5** # 284

Jones, Peter
Cisco Systems

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

PICS are missing.

*SuggestedRemedy*

Complete PICS

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Accommodated by Comment #448.

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*Cl* **192** *SC* **192.13.3** *P* **249** *L* **6** # 120

Kim, Yong
General Motors

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

This sub-clause on, PICS Profoma is incomplete. Please complete.

*SuggestedRemedy*

Please complete.

*Response* *Response Status* **W**

ACCEPT IN PRINCIPLE.

Accommodated by Comment #448.