*Cl* **45** *SC* **45.2.1.6** *P* **33** *L* **46** # 1

Lo, William
Axonne Inc.

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

The field changed to 8 bits. But there is no corresponding change to the description.

*SuggestedRemedy*

45.2.1.6.3 Editors discretion to make changes needed to refer to 8 bits (7:0).

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

ACCEPT IN PRINCIPLE.

This was changed to 8 bits by IEEE Std 802.3df-2024, so they were the ones to change the text. The bit should not be shown as changed by 3dm as it is already "in" the spec.

Add 802.3dk-2026 to the list of specs in the Editing instruction that changed this table.

*Cl* **45** *SC* **45.2.1.16** *P* **36** *L* **17** # 2

Lo, William
Axonne Inc.

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

The ability bits are done inconsisteltly between AT1/AV1 and T1/V1. Ether there should be 1 bit for both AT1/AV1 or separate bits for T1 and V1.
Everything points to register 1.77 anyway so we should make this consistent.

*SuggestedRemedy*

Pick either of the options. I'm ok with either one but prefer option 1 to preserve bits for the future.

Option1:
Consolidate AT1/AV1 into bit 11 and make bit 12 reserved. Consolidate 45.2.1.16.aaaa and aaab into 1 section

Option 2:
Expand T1/V1 in bit 10 into T1 for bit 10, V1 for bit 11, Move AT1 and AV1 up 1 bit.
Split 45.2.1.6.aaac into 2 separate sections, and adjust text in aaaa and aaab to reflect bit movement.

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

ACCEPT IN PRINCIPLE.

Consolidate AT1/AV1 into bit 11 and make bit 12 reserved.

Delete 45.2.1.16.aaaa (renumber the sections below.

Change 45.2.1.16.aaab to:

MultiGBASE-AT1/AV1 ability (1.18.11)

When read as a one, bit 1.18.11 indicates that the PMA/PMD is able to operate as a MultiGBASE-AT1/AV1 PMA/PMD type as indicated in register 1.77. When read as a zero, bit 1.18.11 indicates that the PMA/PMD
is not able to operate as a MultiGBASE-AT1/VV1 PMA/PMD type as indicated in register 1.77.

*Cl* **201** *SC* **201.1.1** *P* **69** *L* **1** # 3

Lo, William — Axonne Inc.

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

Style change

*SuggestedRemedy*

Change line 1, 6, 10:
"When takling about"
To:
"For"

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

ACCEPT.

---

*Cl* **201** *SC* **201.1.3** *P* **60** *L* **7** # 198

Razavi, Alireza — Infineon

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

Missing space and capitalization issues: “NOTE-Annex K” and “leader"and”; LEADER and FOLLOWER should be capitalized.

*SuggestedRemedy*

Change to “NOTE—Annex K … LEADER and FOLLOWER …” and correct spacing and quotation formatting.

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

ACCEPT.

---

*Cl* **201** *SC* **201.1.3** *P* **61** *L* **50** # 268

Wienckowski, Natalie — IVN Solutions LLC

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

The notes on Figure 201-3 and 201-4 don't make sense.

*SuggestedRemedy*

Change the note on Figure 201-3 to: The recovered_clock arc is shown to indicate delivery of the received clock signal by the LS_RX PMA RECEIVE to the HS_TX PMA TRANSMIT for loop timing when PHY_S is in FOLLOWER mode.
Change the note on Figure 201-4 to: The recovered_clock arc is shown to indicate delivery of the received clock signal by the HS_RX PMA RECEIVE to the LS_TX PMA TRANSMIT for loop timing when PHY_D is in FOLLOWER mode.

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

ACCEPT IN PRINCIPLE.

In NOTE for Figure 201-4: Change HS_TX to LS_TX.

---

*Cl* **201** *SC* **201.1.3** *P* **62** *L* **50** # 200

Razavi, Alireza — Infineon

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

Missing space in “arc,FOLLOWER”; also HS_TX is used instead of LS_TX in the PHY_D context.

*SuggestedRemedy*

Change to “NOTE—The recovered_clock arc is shown to indicate delivery of the received clock signal by the LS_RX PMA RECEIVE for loop timing." for figure 201.3,and chnage to “NOTE—The recovered_clock arc is shown to indicate delivery of the received clock signal by the HS_RX PMA RECEIVE for loop timing." for figure 201.3

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

ACCEPT IN PRINCIPLE.

In NOTE for Figure 201-4: Change HS_TX to LS_TX.

---

*Cl* **201** *SC* **201.1.3** *P* **62** *L* **50** # 151

Pandey, Sujan — Velinktech

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

NOTE—The recovered_clock arc,FOLLOWER only, is shown to indicate delivery of the received clock signal by the HS_TX PMA
TRANSMIT for loop timing.

*SuggestedRemedy*

NOTE—The recovered_clock arc,FOLLOWER only, is shown to indicate delivery of the received clock signal by the LS_TX PMA
TRANSMIT for loop timing.

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

ACCEPT IN PRINCIPLE.

In NOTE for Figure 201-4: Change HS_TX to LS_TX.

*Cl* **201** *SC* **201.1.3.4** *P* **64** *L* **20** # 152

Pandey, Sujan Velinktech

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

The wording "time and control link failure, and act as the data source for the PHY control state diagram" is not clear

*SuggestedRemedy*

no suggestion

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

ACCEPT IN PRINCIPLE.

Change: The Link Synchronization function is used when Auto-Negotiation is disabled or not implemented to detect the presence of the link partner, time and control link failure, and act as the data source for the PHY control state diagram.

To: The purposes of the Link Synchronization fuction are to: detect the presence of the link partner; act as the data source for the PHY Control state diagram; and controls behavior on failure, including timeouts. The Link Synchronization function is used when Auto-Negotiation is disabled or not implemented.

*Cl* **201** *SC* **201.1.4** *P* **64** *L* **26** # 201

Razavi, Alireza Infineon

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

Passive voice: “HS_PATH signaling is performed by the HS_TX PCS generating …”.

*SuggestedRemedy*

Grant editorial latitude to convert passive constructions to active. For example, change this instance to “HS_TX PCS generates …”.

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

REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **201** *SC* **201.1.4** *P* **64** *L* **31** # 153

Pandey, Sujan Velinktech

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

PAM2 symbols in the 2.5 Gb/s and

*SuggestedRemedy*

PAM2 symbols on the MDI port in the 2.5 Gb/s and

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

ACCEPT IN PRINCIPLE.

P64L33

Change: Algorithmic mapping from the received signal on the MDI port to RXD<31:0> and RXC<3:0>.

To: Algorithmic mapping from the received signal to RXD<31:0> and RXC<3:0>.

*Cl* **201** *SC* **201.1.4** *P* **64** *L* **45** # 154

Pandey, Sujan Velinktech

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

in definition it is called "normal data mode" but later in text everywhere sometime it is used as normal mode or data mode. Please make it consistent

*SuggestedRemedy*

normal data mode or normal mode or data mode

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

ACCEPT IN PRINCIPLE.

Editor to search for "normal mode" and "normal data mode" and change them to "data mode".

Editor's to use editorial license to explain the first time "data mode" is used, that this means PCS_data_mode.

Editor's should also look for the word "normal" to see if it should actually be "normal mode".

Val to do this in Clause 202 as well.

*Cl* **201** *SC* **201.1.5** *P* **65** *L* **2** # 155

Pandey, Sujan Velinktech

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

to DME symbols in the transmit path

*SuggestedRemedy*

to DME symbols on the MDI port in the transmit path

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

REJECT.

They are DME symbols before they reach the MDI.

*Cl* **201** *SC* **201.1.5** *P* **65** *L* **15** # 156

Pandey, Sujan Velinktech

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

normal mode

*SuggestedRemedy*

normal data mode or normal mode or data mode

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

ACCEPT IN PRINCIPLE.

See #154

*Cl* **201** *SC* **201.2.1** *P* **61** *L* **8** # 199

Razavi, Alireza Infineon

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

Inconsistent naming: “PMA_LINK” in text vs “PMA_Link” in figures.

*SuggestedRemedy*

Normalize the naming to a single format, recommended “PMA_LINK”, throughout the text and figures.

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

ACCEPT IN PRINCIPLE.

Editor to search for "PMA_Link" with any capitalization and change it to "PMA_LINK".

*Cl* **201** *SC* **201.2.1.2.2** *P* **66** *L* **59** # 202

Razavi, Alireza Infineon

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

Broken reference: “Figure 201–32 Figure 149–33”

*SuggestedRemedy*

delete figure 149-33

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

ACCEPT.

*Cl* **201** *SC* **201.3** *P* **74** *L* **11** # 203

Razavi, Alireza Infineon

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

The clause opener “The PCS functions for HS_PATH are as specified for MultiGBASE-T1 PHYs in 149.3 with the exception that …” again over-relies on remote text.

*SuggestedRemedy*

Remove this sentence; Clause 201.3 shall fully describe HS_PATH behavior locally.

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

ACCEPT IN PRINCIPLE.

Delete: The PCS functions for HS_PATH are as specified for MultiGBASE-T1 PHYs in 149.3 with the exception that 2.5Gb/s and 5Gb/s use PAM2 instead of PAM4 in data mode and the differences noted in this subclause.

*Cl* **201** *SC* **201.3.2** *P* **61** *L* **25** # 233

Razavi, Alireza Infineon

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

Undefined variable: 'rx_boundary' and 'tx_boundary' are shown as signals in Figures 201–5, 201–6 (PCS-PMA interface diagrams) and used in state diagram code, but neither is defined in the variable tables of 201.5.2.6.2, 201.5.2.7.1, or 201.5.2.8.1, nor in the PMA service interface description of 201.2.2.

*SuggestedRemedy*

Add definitions for 'rx_boundary' and 'tx_boundary' in 201.2.2 or the appropriate state diagram variable table, specifying their type, source, and role in frame boundary alignment.

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

REJECT.

This comment was WITHDRAWN by the commenter.

These are defined in 149.3.9.4.3

*Cl* **201** *SC* **201.3.2** *P* **61** *L* **40** # 234

Razavi, Alireza Infineon

*Comment Type* **T** *Comment Status* **D** *definitions*

Undefined signal: 'recovered_clock' appears in Figures 201–3 and 201–4 (PHY_S and PHY_D functional block diagrams) as a signal arc between PMA Receive and PMA Transmit, but is not defined as a primitive or variable anywhere in 201.2 or 201.5.

*SuggestedRemedy*

Add 'recovered_clock' to the PMA service interface description in 201.5.2.9 (Clock Recovery), or add a NOTE in 201.5.2.2 (PMA Transmit) explaining its source and usage. The two existing NOTEs in the figures reference it without a normative anchor.

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

PROPOSED REJECT.

This is in 802.3 in multiple places in figures, but there is not a definition anywhere.

*Cl* **201** *SC* **201.3.2** *P* **75** *L* **2** # 204

Razavi, Alireza Infineon

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

Mixed-signal naming inconsistency in Figures 201–7 and 201–8: TXc/TXC.

*SuggestedRemedy*

Normalize all such labels to TXC/RXC across the affected figures.

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

ACCEPT IN PRINCIPLE.

Editor to do a global find and replace to correct the capitalization of TXC and RXC.

*Cl* **201** *SC* **201.3.2** *P* **75** *L* **35** # 231

Razavi, Alireza Infineon

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

Figures 201–8 has formatting issue on HS_RX box, LS_TXI.

*SuggestedRemedy*

Align arrows for loc_rcvr_status, link_status, tx_symb, tx_mode, and pcs_data_mode so they terminate at the bottom of the PCS_RECEIVE and HS_LX PCS_TRANSMIT blocks

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

ACCEPT.

*Cl* **201** *SC* **201.3.2** *P* **75** *L* **35** # 157

Pandey, Sujan Velinktech

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

correct the arrows in the figures

*SuggestedRemedy*

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

ACCEPT IN PRINCIPLE.

See #231

*Cl* **201** *SC* **201.3.2** *P* **75** *L* **36** # 190

Jonsson, Ragnar Infineon

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

Arrow start and finish is not aligned with the box bundary

*SuggestedRemedy*

Align arrows with the box boundary

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

ACCEPT IN PRINCIPLE.

See #231

*Cl* **201** *SC* **201.3.2.2** *P* **76** *L* **32** # 129

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

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

PCS Transmit is more accurately a function, not a process. PCS Receive is more accurately a function, not a process.

*SuggestedRemedy*

Replace, "PCS Transmit process" with "PCS Transmit function" in 11 locations in the document. Replace, "PCS Receive process" with "PCS Receive function" in 11 locations in the document.

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

REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **201** *SC* **201.3.2.2** *P* **101** *L* **50** # 211

Razavi, Alireza — Infineon

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

Field naming drifts between “OAM field” and “OAM_field” in the PCS framing descriptions.

*SuggestedRemedy*

Use tx_oam_field consistently where the transmit OAM field signal is meant.

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

ACCEPT IN PRINCIPLE.

Usage in text (e.g, P76, 77) is correct - it is descriptive. Underscore gets used when it's a variable name.
ERRORS: P83 L12 - change to "OAM field" (descriptive)
P94 L51 - change to "OAM_field" (variable name definition

---

*Cl* **201** *SC* **201.3.2.2.1** *P* **78** *L* **28** # 12

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

the text says ENCODE and DECODE work according to the rules in 201.3.2.2.2, but there are no rules there (this was an error in earlier text, discovered in dg). Since the ENCODE and DECODE functions produce & interpret the 64B/65B blocks, the rules for blocks are indicated. These are in 201.3.2.2.4 (Block structure),

*SuggestedRemedy*

Change 201.3.2.2.2 to 201.3.2.2.4

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

ACCEPT.

---

*Cl* **201** *SC* **201.3.2.2.5** *P* **79** *L* **15** # 13

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

There is no "transcoder". The blocks shown are simply the encoded 65B blocks concatenated. Where the text said transcoder (in 201.3.2.2.12 and 201.4.2.2.12) it clearly meant RS-FEC encoder.

*SuggestedRemedy*

Delete "Output of transcoder" from Figures 201-11 and 201-12, and change "to the transcoder" to "to the RS-FEC encoder" in 201.3.2.2.12 (P83 L3) and 201.4.2.2.12 (P101 L8).

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

ACCEPT.

---

*Cl* **201** *SC* **201.3.2.2.13** *P* **83** *L* **8** # 14

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

We jump directly from tx_coded, a 64B/65B block to "The resulting RS-FEC frame…" only 2 sections later does the RS-FEC encoding get described. This is because we skipped the definition of tx_group50x65B which had been in 201.1.3.1. (an awkward place).

*SuggestedRemedy*

Insert the following new first paragraph for 201.3.2.2.13: "To form the RS-FEC frame, 50 65B blocks are grouped as follows:
tx_group50x65B,65 * i + j> = tx_coded_i <j>
where i= 0 to 49, j = 0 to 64, and tx_coded_i<64:0> is the I th 65B/65B block and tx_coded_0 <64:0> is the first block transmitted."

(note "_" is subscript, and "*" is the multiplication symbol)

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

ACCEPT.

---

*Cl* **201** *SC* **201.3.2.2.18** *P* **83** *L* **38** # 193

Zhu, Liang — Infineon

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

"Dn , which are represented in Figure 201–7 as Dn [0]" -- equation linking error

*SuggestedRemedy*

link to Figure 201–10

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

ACCEPT.

---

*Cl* **201** *SC* **201.3.2.3** *P* **84** *L* **39** # 158

Pandey, Sujan — Velinktech

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

and signals the reliable

*SuggestedRemedy*

and indicates the reliable

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

ACCEPT.

*Cl* **201** *SC* **201.3.2.3** *P* **85** *L* **7** # 205

Razavi, Alireza Infineon

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

Subheadings 201.3.2.3.1 and 201.3.2.3.2 both read “Frame and block synchronization”.

*SuggestedRemedy*

Differentiate the subclause headings if they cover different functions, or confirm and document that the duplication is intentional.

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

ACCEPT IN PRINCIPLE.

See #4

*Cl* **201** *SC* **201.3.2.3** *P* **98** *L* **22** # 210

Razavi, Alireza Infineon

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

State-variable naming drifts between “block lock” and “block_lock”. Sentence reads “It obtains block lock …”.

*SuggestedRemedy*

Change the wording to “the PHY PCS locks the FEC frame …” and use consistent state-variable naming.

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

ACCEPT IN PRINCIPLE.

Entered as 201.3.2.3, P98L22.

Should be 201.3.2.3.2, P85L22

On P85L27
Change: It obtains block_lock to the PHY frames

To: It obtains block lock to the PHY frames

*Cl* **201** *SC* **201.3.2.3.1** *P* **85** *L* **7** # 4

Lo, William Axonne Inc.

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

This section lines 7 to 16 was intended to be replaced with 201.3.2.3.2.

*SuggestedRemedy*

Delete 201.3.2.3.1 in its entirity.

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

ACCEPT.

*Cl* **201** *SC* **201.3.2.3.1** *P* **85** *L* **7** # 194

Zhu, Liang Infineon

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

201.3.2.3.1 and 201.3.2.3.2 have a lot of duplication

*SuggestedRemedy*

merge

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

ACCEPT IN PRINCIPLE.

See #4

*Cl* **201** *SC* **201.3.2.3.1** *P* **85** *L* **9** # 159

Pandey, Sujan Velinktech

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

in the data mode

*SuggestedRemedy*

normal data mode or normal mode or data mode

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

ACCEPT IN PRINCIPLE.

See #154

*Cl* **201** *SC* **201.3.2.3.1** *P* **85** *L* **12** # 160

Pandey, Sujan Velinktech

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

in the data mode

*SuggestedRemedy*

normal data mode or normal mode or data mode

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

ACCEPT IN PRINCIPLE.

See #154

*Cl* **201** *SC* **201.3.2.3.2** *P* **85** *L* **20** # 161

Pandey, Sujan Velinktech

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

in the data mode

*SuggestedRemedy*

normal data mode or normal mode or data mode

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

ACCEPT IN PRINCIPLE.

See #154

*Cl* **201** *SC* **201.3.2.3.2** *P* **85** *L* **25** # 162

Pandey, Sujan Velinktech

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

in the data mode

*SuggestedRemedy*

normal data mode or normal mode or data mode

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

ACCEPT IN PRINCIPLE.

See #154

*Cl* **201** *SC* **201.3.2.3.3** *P* **85** *L* **32** # 206

Razavi, Alireza Infineon

*Comment Type* **E** *Comment Status* **A** *ACT PCS*

The text says “The descrambling process is as specified in 149.3.2.3.2, except Equation (149–5) shall be applied regardless of whether PHY_S is LEADER or FOLLOWER.” The exception ties strongly to Equation (149–5), making the reference too narrow.

*SuggestedRemedy*

Bring the relevant descrambling text and equation content from 149 into Clause 201 so the full rule is stated locally.

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

ACCEPT IN PRINCIPLE.

Replace text in 201.3.2.3.3 with the following:

The descrambler processes the payload to reverse the effect of the scrambler using the same polynomial. The PCS descrambles the data stream and returns the proper sequence of symbols to the decoding process for generation of RXD<31:0> to the XGMII. PHY_D shall employ the receiver descrambler generator polynomial defined by Equation (201-xxx). Equation (201-xxx) is applied regardless of whether PHY_D is LEADER or FOLLOWER.

Delete 201.3.4. Fix references to this deleted section.

Create a new subclause between 201.3.2.2.18 an 201.3.2.2.19 titled: PCS scrambler polynomial

The text in this new subclause is:

The PHY_S PCS Transmit process shall employ Equation (201-xxx) as PHY_S transmitter side-stream scrambler generator polynomial. TEquation (201-xxx) is applied regardless of whether PHY_S is LEADER or FOLLOWER.

Insert equation 149-6 as 201-xxx here.

An implementation of side-stream scramblers by linear-feedback shift registers is shown in Figure 149–11. The bits stored in the shift register delay line at time n are denoted by Scrn[32:0]. At each symbol period, the shift register is advanced by one bit, and one new bit represented by Scrn[0] is generated. The transmitter side-stream scrambler is reset upon execution of the PCS Reset function. If PCS Reset is executed, all bits of the 33-bit vector representing the side-stream 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.

This scrambler, once started during PMA TRAINING STATE, shall continue to run uninterrupted during transition from SEND_T to SEND_N.

======Now do a similar thing for LS_PATH.======

Replace text in 201.4.2.3.2 with the following:

The descrambler processes the payload to reverse the effect of the scrambler using the same polynomial. The PCS descrambles the data stream and returns the proper sequence of symbols to the decoding process for generation of RXD<31:0> to the XGMII. PHY_S shall employ the receiver descrambler generator polynomial defined by Equation (201-yyy). Equation (201-yyy) is applied regardless of whether PHY_S is LEADER or FOLLOWER.

Delete 201.4.4. Fix references to this deleted section.

Create a new subclause between 201.4.2.2.15 an 201.4.2.2.16 titled: PCS scrambler polynomial

The PHY_D PCS Transmit process shall employ Equation (201-yyy) as PHY_D transmitter side-stream scrambler generator polynomial. Equation (201-yyy) is applied regardless of whether PHY_D is LEADER or FOLLOWER.

Insert equation 149-5 as 201-yyy here.

An implementation of side-stream scramblers by linear-feedback shift registers is shown in Figure 149–11. The bits stored in the shift register delay line at time n are denoted by Scrn[32:0]. At each symbol period, the shift register is advanced by one bit, and one new bit represented by Scrn[0] is generated. The transmitter side-stream scrambler is reset upon execution of the PCS Reset function. If PCS Reset is executed, all bits of the 33-bit vector representing the side-stream 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.

This scrambler, once started during PMA TRAINING STATE, shall continue to run uninterrupted during transition from SEND_T to SEND_N.

---

*Cl* **201** *SC* **201.3.2.3.4** *P* **85** *L* **37** # 266

Wienckowski, Natalie IVN Solutions LLC

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

Refers to 149, but needs to be brought in to refer to 201 specific requirements and Figures.

*SuggestedRemedy*

Copy 149.3.2.3.3 into 201.3.2.3.4, and change the reference to be to 201.3.2.2.13.

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

ACCEPT.

---

*Cl* **201** *SC* **201.3.4** *P* **85** *L* **32** # 207

Razavi, Alireza Infineon

*Comment Type* **E** *Comment Status* **A** *ACT PCS*

For readability, import Section 149.4.3 and Equations (149–5) and (149–6) into Clause 201. Text of 149.3.4 should also be moved, as it contains key information.

*SuggestedRemedy*

see comment

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

ACCEPT IN PRINCIPLE.

See #206.

---

*Cl* **201** *SC* **201.3.5** *P* **86** *L* **2** # 163

Pandey, Sujan Velinktech

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

shown in Figure 201-16

*SuggestedRemedy*

shown in Figure 201-15

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

ACCEPT.

---

*Cl* **201** *SC* **201.3.5** *P* **86** *L* **5** # 164

Pandey, Sujan Velinktech

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

shown in Figure 201-15

*SuggestedRemedy*

shown in Figure 201-16

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

ACCEPT.

*Cl* **201** *SC* **201.3.5** *P* **86** *L* **39** # 208

Razavi, Alireza Infineon

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

"InfoField" should be "Infofield" to align with the rest of the text.

*SuggestedRemedy*

see comment

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

ACCEPT IN PRINCIPLE.

Search the document for various capitalizations and change all to "Infofield".

*Cl* **201** *SC* **201.3.6.1** *P* **87** *L* **2** # 15

Zimmerman, George CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

201.3.6.1 is unnecessary, since this has been previously stated for the entire clause (in 201.1.7)

*SuggestedRemedy*

Delete 201.3.6.1

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

ACCEPT.

*Cl* **201** *SC* **201.3.8** *P* **94** *L* **41** # 209

Razavi, Alireza Infineon

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

The OAM field is tied to two different defining subclauses: 201.3.8 points to 201.3.2.2.13, while 201.3.8.1 points to 201.3.2.2.14.

*SuggestedRemedy*

Clarify that the OAM frame data is carried in the 10-bit OAM field described in 201.3.2.2.13 for HS_PATH.

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

ACCEPT IN PRINCIPLE.

In 201.3.8.1, change the reference to 201.3.2.2.13.

*Cl* **201** *SC* **201.4** *P* **96** *L* **10** # 263

Wienckowski, Natalie IVN Solutions LLC

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

Change references to 149 to those in 201.3 as content was brought in from 149.

*SuggestedRemedy*

P96L33: Change 149.3.2.1 to 201.3.2.1
P96L37&P101L7: Change Figure 149-16 to Figure 201-18.
P104L10&P104L25: Change Figure 149-18 to Figure 201-19.
P104L12: Change 149.3.7.2.2 to 201.3.6.2.2.

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

ACCEPT.

*Cl* **201** *SC* **201.4.2.2** *P* **96** *L* **41** # 264

Wienckowski, Natalie IVN Solutions LLC

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

Reference to 149-16 replaced by 201-18, which has no dashed rectangles.

*SuggestedRemedy*

Delete sentence: Dashed rectangles in Figure 149-16 are not part of the low speed PCS.

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

ACCEPT.

*Cl* **201** *SC* **201.4.2.2** *P* **97** *L* **26** # 239

Wang, Frank Realtek Semiconductor Corp.

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

typo: no space after comma

*SuggestedRemedy*

change "(50,46, 6)" to "(50,46,6)"

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

ACCEPT.

*Cl* **201** *SC* **201.4.2.2** *P* **98** *L* **38** # 235

Razavi, Alireza Infineon

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

Notation inconsistency.'RS-FEC(50,46) ( in figures) ' and 'RS-FEC(50,46,6)' (120 occurrences).

*SuggestedRemedy*

please use RS-FEC(50,46,6)

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

ACCEPT.

*Cl* **201** *SC* **201.4.2.2.1** *P* **98** *L* **4** # 16

Zimmerman, George CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

RS_FEC should be RS-FEC

*SuggestedRemedy*

See comment.

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

ACCEPT.

*Cl* **201** *SC* **201.4.2.2.2** *P* **98** *L* **39** # 240

Wang, Frank Realtek Semiconductor Corp.

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

typo: insert a space before "decoder"

*SuggestedRemedy*

change "RS-FEC(50,46)decoder" to "RS-FEC(50,46) decoder"

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

ACCEPT.

*Cl* **201** *SC* **201.4.2.2.14** *P* **101** *L* **51** # 212

Razavi, Alireza Infineon

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

RS-message assignment text uses vendor-specific_fielld<5:0> (double “l” in “field”).

*SuggestedRemedy*

see comment

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

ACCEPT.

*Cl* **201** *SC* **201.4.2.2.14** *P* **102** *L* **43** # 241

Wang, Frank Realtek Semiconductor Corp.

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

typo: no space after comma

*SuggestedRemedy*

change "RS-FEC(50, 46)" to "RS-FEC(50,46)"

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

ACCEPT.

*Cl* **201** *SC* **201.4.2.2.16** *P* **103** *L* **14** # 5

Lo, William Axonne Inc.

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

Copy and paste error

*SuggestedRemedy*

sections 201.4.2.2.16 to 201.4.2.2.22 should be deleted in its entirity

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

ACCEPT.

*Cl* **201** *SC* **201.4.2.2.18** *P* **103** *L* **22** # 213

Razavi, Alireza Infineon

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

High-speed-path wording is used inside a low-speed-path subsection (e.g., “All incoming PAM2 path HS_RX …”). Low-speed-path scrambling text points to 201.3.4, which appears to be a carried-over high-speed reference rather than a local 201.4 reference.

*SuggestedRemedy*

Review and update the text and references to use the correct LS_PATH wording and the correct local Clause 201.4 subclause references.

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

ACCEPT IN PRINCIPLE.

see #5 which deletes this text

*Cl* **201** *SC* **201.4.2.3** *P* **96** *L* **41** # 265

Wienckowski, Natalie IVN Solutions LLC

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

Reference to 149-18 replaced by 201-19, which has no dashed rectangles.

*SuggestedRemedy*

Delete sentence: Dashed rectangles in Figure 149-18 are not part of the low speed PCS.

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

ACCEPT.

*Cl* **201** *SC* **201.4.2.3** *P* **104** *L* **30** # 165

Pandey, Sujan Velinktech

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

signals

*SuggestedRemedy*

indicates

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

ACCEPT.

*Cl* **201** *SC* **201.4.2.3.2** *P* **105** *L* **6** # 6

Lo, William Axonne Inc.

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

Inconsistent referencing.
201.4.2.2.15 points to 201.4.4
This section should do so as well.

*SuggestedRemedy*

Delete the existing text and replace with:The descrambling process is as specified in 149.3.2.3.2, except gM(x) shall be applied as defined in 201.4.4.

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

REJECT.

The text is consistent with 201.3.2.3.3, the corresponding HS_PATH section.

*Cl* **201** *SC* **201.4.5** *P* **105** *L* **54** # 7

Lo, William Axonne Inc.

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

There is no 64 to 65 bit conversion for the training frame

*SuggestedRemedy*

Change 64B/65B to 65-bit

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

ACCEPT.

*Cl* **201** *SC* **201.4.6** *P* **106** *L* **45** # 8

Lo, William Axonne Inc.

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

We went through all the trouble to put in 201.3.6 so we should point to that.

*SuggestedRemedy*

Detailed functions and state diagrams are as specified in 201.3.6

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

ACCEPT.

*Cl* **201** *SC* **201.4.7** *P* **106** *L* **48** # 9

Lo, William Axonne Inc.

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

This section is identical to 201.3.7 so we should point to that.

*SuggestedRemedy*

Delete all contents in 201.4.7 including subclauses and replace with:
See 201.3.7.

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

ACCEPT.

*Cl* **201** *SC* **201.4.8** *P* **107** *L* **31** # 195

Zhu, Liang Infineon

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

"The MultiG+100MBASE-T1/V1 PCS level operations administration, and ..." -- HS type in LS chapter

*SuggestedRemedy*

change to 100M+MultiGBASE-T1/V1…

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

ACCEPT.

*Cl* **201** *SC* **201.5.2.2** *P* **109** *L* **27** # 10

Lo, William Axonne Inc.

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

Grammar.

*SuggestedRemedy*

Line 17 "A PHY_D" and "A PHY_S" should be "PHY_D" and "PHY_S"

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

ACCEPT IN PRINCIPLE.

Change: A PHY_D
To: Each PHY_D

Change: A PHY_S
To: Each PHY_S

*Cl* **201** *SC* **201.5.2.4** *P* **111** *L* **1** # 166

Pandey, Sujan Velinktech

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

The infofield is also denoted IF

*SuggestedRemedy*

The infofield is also denoted as IF

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

ACCEPT IN PRINCIPLE.

Change: The Infofield is also denoted IF. The link partner is not required to decode every IF transmitted but is required to decode IFs at a rate that enables the correct actions prior to the PAM2 to PAM4 transition.

To: The link partner is not required to decode every Infofield transmitted but is required to decode Infofields at a rate that enables the correct actions prior to the PAM2 to PAM4 transition.

*Cl* **201** *SC* **201.5.2.4.4** *P* **112** *L* **20** # 214

Razavi, Alireza Infineon

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

“message field” capitalization is inconsistent.

*SuggestedRemedy*

Use “Message Field” consistently throughout the text.e capitalize "Message Field" in titles of tables 201-5 and 201-6.

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

ACCEPT IN PRINCIPLE.

Change: message field

To: Message Field in titles of Tables 201-5, 201-6, and 202-9.

*Cl* **201** *SC* **201.5.2.4.6** *P* **113** *L* **27** # 127

van Dyck, Peter Infineon

*Comment Type* **T** *Comment Status* **D** *ACT Infofield*

Since the time to send a complete set of infofields is speed dependent, see 201.5.2.4, the length of the countdown must also be speed dependent for HS_PATH.

*SuggestedRemedy*

Replace:
"DataSwPFC24 shall be a minimum of 4081 and a maximum
of 4785 from the current PFC24 value."
With:
"For 10Gb/s and 5Gb/s, DataSwPFC24 shall be a minimum of 4081 and a maximum
of 4785 from the current PFC24 value. For 2.5Gb/s, DataSwPFC24 shall be a minimum of 2033 and a maximum
of 2385 from the current PFC24 value."

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

PROPOSED ACCEPT.

*Cl* **201** *SC* **201.5.2.5.4** *P* **112** *L* **50** # 217

Razavi, Alireza Infineon

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

OAMen is expanded differently in HS_PATH and LS_PATH text.

*SuggestedRemedy*

Change "OAMen indicates MultiGBASE-T1 OAM capability enable, respectively. The PHY shall indicate the
support of optional capabilities by setting the corresponding capability bits." - change to read: "OAMen indicates that the MultiGBASE-T1 OAM capability is enabled." (the second shall isn't needed, and grammar is fixed). In 201.5.2.5.4 (P116 L1) change "OAMen indicates 100M+MultiGBASE-T1/V1 OAM capability enable. The PHY shall indicate the support of this OAM capability by setting the OAMen capability bit to 1." to "OAMen indicates that the MultiGBASE-T1 OAM capability is enabled." (there is only one OAM capability, since both link partners need to exchange it - and the second shall isn't needed again.)

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

ACCEPT.

*Cl* **201** *SC* **201.5.2.6.1** *P* **116** *L* **24** # 215

Razavi, Alireza Infineon

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

Labels “startup sequence” and “PHY Control function, HS_PATH, LS_PATH” are redundant.

*SuggestedRemedy*

see comment

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

ACCEPT IN PRINCIPLE.

Delete the heading: 201.5.2.6.1 Startup Sequence, but leave the text so it is now under 201.5.2.6 PHY Control function, HS_PATH and LS_PATH.

*Cl* **201** *SC* **201.5.2.6.1** *P* **116** *L* **27** # 216

Razavi, Alireza Infineon

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

Startup Sequence text uses mr_autoneg_en, while PHY Control / Link Synchronization uses mr_autoneg_enable.

*SuggestedRemedy*

Use mr_autoneg_enable consistently throughout.

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

ACCEPT.

*Cl* **201** *SC* **201.5.2.6.1** *P* **117** *L* **6** # 236

Razavi, Alireza Infineon

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

replace 'en_slave_tx = 1' with en_follower_tx =1'.

*SuggestedRemedy*

see comment

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

ACCEPT IN PRINCIPLE.

Make the correction on P117L6 and P117L24.

*Cl* **201** *SC* **201.5.2.6.3** *P* **119** *L* **26** # 269

van Dyck, Peter Infineon

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

Actual timer value for minwait_timer missing.

*SuggestedRemedy*

Add sentence at the end of minwait_timer definition:
"The timer shall expire 475 us +- 50 us after being started."

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

ACCEPT.

*Cl* **201** *SC* **201.5.2.6.4** *P* **120** *L* **33** # 218

Razavi, Alireza Infineon

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

The condition loc_rcvr_status = OK should apply to both PHY_D and PHY_S for TX_SWITCH state

*SuggestedRemedy*

see comment

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

REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **201** *SC* **201.5.2.8.1** *P* **124** *L* **1** # 191

Jonsson, Ragnar Infineon

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

Incorrect condition for TRUE state

*SuggestedRemedy*

Change "No SEND_S pulses" to "Less than three SENBD_S pulses".

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

PROPOSED ACCEPT IN PRINCIPLE.

TFTD - Is this a change to the decision in Vancouver, or was this implemented incorrectly?

Correct spelling of suggested remedy:

Change "No SEND_S pulses" to "Less than three SEND_S pulses".

*Cl* **201** *SC* **201.5.2.8.1** *P* **124** *L* **4** # 192

Jonsson, Ragnar Infineon

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

Incorrect condition for FALSE state

*SuggestedRemedy*

Change "At least one SEND_S pulse" to At least three SEND_S pulses".

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

PROPOSED ACCEPT IN PRINCIPLE.

TFTD - Is this a change to the decision in Vancouver, or was this implemented incorrectly?

*Cl* **201** *SC* **201.5.2.10** *P* **127** *L* **8** # 219

Razavi, Alireza Infineon

*Comment Type* **E** *Comment Status* **D** *ACT MDI*

Text should be brought in from Clause 149, and subclauses 201.5.2.11 and 201.5.2.10 should be merged. It would be helpful to add a sentence describing the difference between MDI for T1 and V1.

*SuggestedRemedy*

see comment

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

PROPOSED ACCEPT IN PRINCIPLE.

Replace 201.5.2.10 with the following:

201.5.2.10 MDI, T1
Communication through the T1 MDI is summarized in 201.5.2.10.1 and 201.5.2.10.2.

201.5.2.10.1 MDI signals transmitted by the PHY

The symbols to be transmitted by the PMA are as described in the PMA Transmit function (201.5.2.2). The PMA Transmit function generates a pulse-amplitude modulated signal on the single shielded balanced pair of conductors in the following form:
Copy equation 149-12
where a_n is the modulation symbol transmitted at time nT, and h_T(t) denotes the system symbol response at the MDI. The symbol response shall comply with the electrical specifications given in 201.6.2 for the HS_TX path and 201.7.2 for the LS_TX path.

201.5.2.10.2 Signals received at the MDI
Signals received at the T1 MDI can be expressed as pulse-amplitude modulated signals that are corrupted by noise as follows:
Copy equation 149-13
where h_R(t) denotes the symbol response of the overall channel impulse response between the transmit symbol source and the receive MDI, and w(t) represents the contribution of various noise sources including uncancelled echo. The received signal is processed within the PMA Receive function to yield the received symbols rx_symb. The channel shall meet the requirements of 201.9 for the -T1 link segment.

=====

Replace 201.5.2.11 with the following:

201.5.2.11 MDI, V1
The V1 MDI is as described in 201.5.2.10, with the following exceptions:
1. The signal is single-ended and is carried over a single coaxial cable.
2. The channel shall meet the requirements of 201.10 for the -V1 link segment.

*Cl* **201** *SC* **201.6.2.2** *P* **131** *L* **43** # 267

Wienckowski, Natalie IVN Solutions LLC

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

No specific changes have been requested.

*SuggestedRemedy*

Delete Editor's Note

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

ACCEPT.

*Cl* **201** *SC* **201.6.2.3.2** *P* **133** *L* **24** # 196

Wei, Fan Infineon

*Comment Type* **T** *Comment Status* **A** *ACT tests*

Should separate PAM4 and PAM2 mode EOJ test method, for PAM4, follow 94.3.12.6.2.with JP03B pattern, while for PAM2, pattern changed to 1010 patter, should follow a PAM2 standard, i.e. 130.7.1.9

*SuggestedRemedy*

To measure peak-to-peak even-odd jitter (EOJpk-pk), for PAM4 mode, follow the steps as specified in 94.3.12.6.2; for PAM2 mode, follow the steps as specified in 130.7.1.9

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

ACCEPT IN PRINCIPLE.

To measure peak-to-peak even-odd jitter (EOJpk-pk), for 10 Gb/s, follow the steps as specified in 94.3.12.6.2; for 5 Gb/s and 2.5 Gb/s, follow the steps as specified in 130.7.1.9.

*Cl* **201** *SC* **201.6.2.5** *P* **135** *L* **37** # 11

Lo, William Axonne Inc.

*Comment Type* **T** *Comment Status* **D** *ACT peak output*

10GBASE-T1 PSD in 149.5.2.4 is -1dBm to 2 dBm.and 149.5.2.5 peak is less than 1.3V 201.6.2.4 for 10G also lists PSD of -1dBm to 2 dBm.but 201.6.2.5 list the max peak as 1.7V which is inconsistent.

*SuggestedRemedy*

Change 1.7 to 1.3
Change 0.85 to 0.65

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

PROPOSED ACCEPT IN PRINCIPLE.

TFTD. There was a lot of discussion on this topic in November 2025.

*Cl* **201** *SC* **201.6.3.1** *P* **136** *L* **8** # 220

Razavi, Alireza Infineon

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

The test is called “BER monitoring” in Table 201–13.

*SuggestedRemedy*

Adjust the segment title to match “ frame error ratio requirment” and state explicitly that Test Mode 7 can be used.

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

REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **201** *SC* **201.6.3.1** *P* **136** *L* **11** # 197

Wei, Fan Infineon

*Comment Type* **T** *Comment Status* **A** *ACT tests*

Low speed RX spec refers to high speed spec, which is 1e-12, for 100M signal, to qualify 1e-12, the test time will be too long, low speed should follow 100BT1 spec, which is 1e-10

*SuggestedRemedy*

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

ACCEPT IN PRINCIPLE.

Replace 201.7.3 with:

201.7.3 Receiver electrical specifications
The PMA provides the Receive function specified in 201.5.2.3 in accordance with the electrical specifications of this clause using cabling that is within the limits specified in 201.9 for -T1 and 201.10 for - V1.
201.7.3.1 Receiver differential input signals
The signal received at the MDI that was transmitted from a remote transmitter within the specifications of 201.7.2 and have passed through a link specified in 201.9 for -T1 and 201.10 for -V1 shall be received with a BER less than 10-10 after RS-FEC decoding, and sent to the XGMII after link reset completion. This
specification can be verified by a frame error ratio less than 10-7 for 125-octet packets measured at the MAC/PLS service interface.
201.7.3.2 Broadband stationary noise rejection
This specification is provided to verify the receiver’s tolerance to broadband stationary noise from a variety of sources. The test is performed with a noise source consisting of a signal generator with Gaussian distribution, bandwidths, and magnitudes shown in Table 201–22. The receive DUT is connected to the
noise source through a directional coupler, as shown in Figure 201–45, with a link segment as defined in 201.9 for -T1 and shown in Figure 201–46, with a link segment as defined in 201.10 for -V1. The BER is expected to be less than 10–10, and to satisfy this specification, the frame loss ratio is less than 10–7 for 125-octet packets measured at the MAC/PLS service interface.
KEEP table 201-21!

In addition:
Change the reference in 201.6.3 from 201.3.2.3 to 201.5.2.3.

Change the reference in 201.6.2 from 201.3.2.2 to 201.5.2.2.

Change the reference in 201.7.2 from 201.3.2.2 to 201.5.2.2.

*Cl* **201** *SC* **201.6.3.1** *P* **143** *L* **1** # 228

Razavi, Alireza Infineon

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

section 201.6.4 , and 201.7.4 should be removed

*SuggestedRemedy*

see comment

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

ACCEPT.

*Cl* **201** *SC* **201.6.3.2** *P* **136** *L* **22** # 114

Zimmerman, George CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

The broadband stationary noise test is missing a "shall" (both 201 & 202)

*SuggestedRemedy*

change "the frame loss ratio is less than" to "the frame loss ratio shall be less than" at P136 L22, and P228 L9 (202.5.3.2)

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

REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **201** *SC* **201.6.3.2** *P* **137** *L* **19** # 221

Razavi, Alireza Infineon

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

An Editor’s Note remains in the clause text.

*SuggestedRemedy*

Delete the editor's note at the end of 201.6.3.2

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

ACCEPT.

*Cl* **201** *SC* **201.7.1** *P* **138** *L* **11** # 222

Razavi, Alireza Infineon

*Comment Type* **T** *Comment Status* **R** *ACT tests*

the standard text already makes clear that if one direction requires a precoder, the transmitter shall provide it. The section should not define a test for each “shall” statement.

*SuggestedRemedy*

Remove Test Mode 3 and the precoder test.

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

REJECT.

Test mode 3 has already been removed from 201.7.1.

Comment was intended for 201.6.1

No agreement in TF to make a change.

*Cl* **201** *SC* **201.7.2** *P* **138** *L* **42** # 223

Razavi, Alireza Infineon

*Comment Type* **E** *Comment Status* **A** *ACT tests*

For readability, ordering test descriptions by test mode would be helpful.

*SuggestedRemedy*

see comment

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

ACCEPT IN PRINCIPLE.

See ACT proposal for 201_7_2_x_040326.pdf and ACT proposal for 201_6_2_x_040326.pdf.

*Cl* **201** *SC* **201.7.2.3** *P* **139** *L* **47** # 224

Razavi, Alireza Infineon

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

Timing jitter test text appears in 201.6.2.3 and 201.7.2.3 but needs clarification and a clear distinction between the two tests. If they are equivalent, one should reference the other to reduce ambiguity.

*SuggestedRemedy*

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

REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **201** *SC* **201.7.2.4** *P* **140** *L* **27** # 225

Razavi, Alireza Infineon

*Comment Type* **E** *Comment Status* **A** *ACT tests*

It would improve clarity if the draft explicitly stated that MDI deterministic jitter is not defined for low data rate.

*SuggestedRemedy*

Add subsections for transmit MDI random jitter and transmit MDI deterministic jitter, and state that MDI deterministic jitter for low data rate is not defined. Use the same structural approach for the high data-rate direction.

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

ACCEPT IN PRINCIPLE.

See ACT proposal for 201_7_2_x_040326.pdf and ACT proposal for 201_6_2_x_040326.pdf.

*Cl* **201** *SC* **201.7.2.6** *P* **142** *L* **27** # 227

Razavi, Alireza Infineon

*Comment Type* **E** *Comment Status* **A** *ACT tests*

The test mode for peak output is not explicitly mentioned.

*SuggestedRemedy*

State explicitly that Test Mode 5 can be used for the peak output test. Apply the same clarification for the low data-rate direction.

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

ACCEPT IN PRINCIPLE.

See ACT proposal for 201_7_2_x_040326.pdf and ACT proposal for 201_6_2_x_040326.pdf.

*Cl* **201** *SC* **201.7.2.7** *P* **142** *L* **40** # 226

Razavi, Alireza Infineon

*Comment Type* **E** *Comment Status* **A** *ACT tests*

The test mode for clock frequency is not explicitly mentioned.

*SuggestedRemedy*

State explicitly that Test Mode 2 can be used for the clock frequency test. Apply the same clarification for the low data-rate direction.

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

ACCEPT IN PRINCIPLE.

See ACT proposal for 201_7_2_x_040326.pdf and ACT proposal for 201_6_2_x_040326.pdf.

*Cl* **201** *SC* **201.9.1.2** *P* **145** *L* **10** # 232

Razavi, Alireza Infineon

*Comment Type* **T** *Comment Status* **D** *ACT RL*

to be consistent with other setting, return loss for 2.5G may cover up to 2G not 4G

*SuggestedRemedy*

define Fmax similar to equation 201-14.

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

PROPOSED ACCEPT IN PRINCIPLE.

TFTD

*Cl* **201** *SC* **201.10.1.5** *P* **146** *L* **48** # 229

Razavi, Alireza Infineon

*Comment Type* **T** *Comment Status* **D** *ACT SA*

Screen attenuation lower-frequency limit is 30 MHz in Clause 149.

*SuggestedRemedy*

Use 30 MHz as the lower bound and update Figure 201–51 accordingly.

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

PROPOSED ACCEPT IN PRINCIPLE.

TFTD

*Cl* **201** *SC* **201.10.2.1.** *P* **148** *L* **18** # 230

Razavi, Alireza Infineon

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

Please add the word “loss” after PSANEXT on the vertical-axis label.

*SuggestedRemedy*

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

ACCEPT.

*Cl* **201** *SC* **201.14** *P* **152** *L* **45** # 122

Turner, Max Ethernovia

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

it is from S to D PHY, i.e. 2 PHYs

*SuggestedRemedy*

add a plural s to PHY

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

ACCEPT IN PRINCIPLE.

Change: The HS_PATH delays for an implementation of the PHY (local XGMII to remote XGMII link delay minus the link segment propagation delay) shall not exceed the limits shown in Table 201–24.

To: The HS_PATH delay between the PHYs (local XGMII to remote XGMII link delay minus the link segment propagation delay) shall not exceed the limits shown in Table 201–24.

*Cl* **201** *SC* **201.14** *P* **152** *L* **50** # 123

Turner, Max Ethernovia

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

it is from D to S PHY, i.e. 2 PHYs

*SuggestedRemedy*

add a plural s to PHY

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

ACCEPT IN PRINCIPLE.

Change: The LS_PATH delays for an implementation of the PHY (local XGMII to remote XGMII link delay minus the link segment propagation delay) shall not exceed the limits shown in Table 201–24.

To: The LS_PATH delay between the PHYs (local XGMII to remote XGMII link delay minus the link segment propagation delay) shall not exceed the limits shown in Table 201–24.

*Cl* **201** *SC* **201.14** *P* **153** *L* **17** # 121

Turner, Max Ethernovia

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

the link to Annex 201A is wrong (A is missing) and the hyperlink does not work

*SuggestedRemedy*

change to Annex 201A and add hyperlink

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

ACCEPT.

*Cl* **201A** *SC* **201A** *P* **149** *L* **26** # 125

Turner, Max Ethernovia

*Comment Type* **T** *Comment Status* **D** *Autoneg*

For interleaving, this definition is useless, as the X(n) may completely chnage order on the MDI

*SuggestedRemedy*

The only useful reference point is the beginng of the first superframe of an interleaving block, but it seems we lack good naming for this.
Commenter to provide a presentation, as this text field will not suffice.

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

PROPOSED ACCEPT IN PRINCIPLE.

TFTD

See 2026-04_Turner-Comment-Annex201A.pdf

*Cl* **201A** *SC* **201A** *P* **149** *L* **29** # 126

Turner, Max — Ethernovia

*Comment Type* **T** *Comment Status* **D** *Autoneg*

For interleaving, this definition is useless, as the X(n) may completely chnage order on the MDI

*SuggestedRemedy*

The only useful reference point is the beginng of the first superframe of an interleaving block, but it seems we lack good naming for this.
Commenter to provide a presentation, as this text field will not suffice.

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

PROPOSED ACCEPT IN PRINCIPLE.

TFTD

See 2026-04_Turner-Comment-Annex201A.pdf

*Cl* **201A** *SC* **201A** *P* **249** *L* **21** # 124

Turner, Max — Ethernovia

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

https://www.merriam-webster.com/dictionary/insure - seems not the most fitting term

*SuggestedRemedy*

replace insure by ensure

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

ACCEPT IN PRINCIPLE.

"ensure" is a reserved word for IEEE SA mandatory editorial coordination, to be avoided. Let's fix this right by rewording now. There are many possible decent substitutes, and we all agree "insure" is wrong. Going with a one-word change is probably best – Suggest, change "insure" to "establish": "To establish a consistent methodology on measuring the delays is used by all implementations, the following points in the data stream are used."

*Cl* **202** *SC* **202.1** *P* **157** *L* **8** # 150

Gorshe, Steve — Microchip Technology

*Comment Type* **E** *Comment Status* **D** *Editorial*

Proposed editorial clean up in multiple places

*SuggestedRemedy*

See proposed editorial changes in attached file 8023d0pc-202-gorshe.docx

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

PROPOSED ACCEPT IN PRINCIPLE.

Insert changes in file 8023d0pc-202-gorshe.docx

Grant Editorial license to implement in alignment with Style.

*Cl* **202** *SC* **202.1.1** *P* **157** *L* **14** # 140

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

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

Content has been added to address all Editor's Notes in clause 202.

*SuggestedRemedy*

Delete all Editor's Notes in clause 202. Grant Editor's license to work with TDD champion to determine appropriate insertion text as needed for grammatical and technical correctness.

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

ACCEPT.

*Cl* **202** *SC* **202.1.3** *P* **159** *L* **2** # 128

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

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

Ensure that all figures, tables, and equations have a text call-out.

*SuggestedRemedy*

Insert, " The MultiGBASE-A functional block diagram is shown in Figure 202-1."

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

ACCEPT.

*Cl* **202** *SC* **202.1.3** *P* **159** *L* **6** # 167

Chini, Ahmad — Broadcom

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

The text use training mode while the diagram shows training_phase.

*SuggestedRemedy*

Replace
training Phase
with
training_mode

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

REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **202** *SC* **202.1.3** *P* **159** *L* **18** # 173

Chini, Ahmad — Broadcom

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

Arrow going out from Link Monitor is going nowwhere

*SuggestedRemedy*

Remove the arrow going out from Link Monitor Block

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

ACCEPT IN PRINCIPLE.

Accomodated by Comment #242.

*Cl* **202** *SC* **202.1.3** *P* **159** *L* **19** # 242

Wang, Frank — Realtek Semiconductor Corp.

*Comment Type* **E** *Comment Status* **D** *State diagrams*

It could be an accident when the editor tried to solve comment #213 for D0pb (remove the connection between "LINK MONITOR" and "Technology Dependent Interface (optional)"). An arrow going out from "Link Monitor" is now going nowwhere.

*SuggestedRemedy*

The output of "LINK MONITOR" should be connected to "PCS TRANSMIT", "PCS OAM", and "PCS RECEIVE".

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

PROPOSED ACCEPT IN PRINCIPLE.

The output of "LINK MONITOR" should be connected to "PCS TRANSMIT", "PCS OAM", and "PCS RECEIVE".

Move the stray "connector dot" in the connection from PCS RECEIVE TO PCS TRANSMIT to the intersection of LINK MONITOR with PCS OAM as the LINK MONITOR is providing the link_status signal.

*Cl* **202** *SC* **202.1.3** *P* **159** *L* **29** # 17

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

*Comment Type* **T** *Comment Status* **A** *State diagrams*

detect_lp_burst is never used by the PCS. It's action is all within the PMA PHY Control, so it shouldn't be a primitive or presented at the PMA Service Interface.

*SuggestedRemedy*

Delete line from PMA RECEIVE to PCS_RECEIVE in Figure 202-1, put arrowhead into PHY CONTROL for this signal.
Delete PMA_DET_LP_BURST.indication primitive (202.2.1 P163 L37,and 202.2.1.10 and subclauses P169 L28 to L36)
Delete line going to the PMA SERVICE INTERFACE in Figure 202-22 (P206 L16)

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

ACCEPT IN PRINCIPLE.

(Editor's note: Commenter to clarify what "put arrowhead into PHY CONTROL for this signal" means.)

In Figure 202-1, detect_lp_burst goes out of PMA RECEIVE and into PHY CONTROL, put arrowhead into PHY CONTROL for this signal. Remove the input to PCS RECEIVE.

Delete PMA_DET_LP_BURST.indication primitive (202.2.1 P163 L37, and 202.2.1.10 and subclauses P169 L28 to P170 L3)

Delete detect_lp_burst line going to the PMA SERVICE INTERFACE in Figure 202-22 (P206 L16), keep detect_lp_burst going from PMA RECEIVE to PHY CONTROL.

*Cl* **202** *SC* **202.1.3.1** *P* **160** *L* **18** # 243

Wang, Frank — Realtek Semiconductor Corp.

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

According to https://www.ieee802.org/3/dm/public/0126/muma_3dm_01_0126.pdf, some numbers are not updated yet.

*SuggestedRemedy*

change "L × 1040 bits" to "L × 1024 bits"

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

ACCEPT.

*Cl* **202** *SC* **202.1.4** *P* **161** *L* **39** # 18

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

*Comment Type* **T** *Comment Status* **D** *Terminology*

The text says LS_PATH PCS generates continuous code-group sequences that the PMA transmits. Is this correct? I thought the TDD bursts were separated by the PCS, with the PMA not transmitting in between.

*SuggestedRemedy*

change "generating continuous code-group sequences" to "generating bursts of code-group sequences"

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

PROPOSED ACCEPT IN PRINCIPLE.

TFTD. Consider with Comment #20.

(Editor's Note: The term code-group has been carried forward since clause 96 where the PMA received code-groups, however clause 96 actually defines code-group transfer to PMA as tx_symb_vector and a code-group is a "pair of ternary symbols". Now clause 202 transfers 1 symbol at a time from PCS to PMA, so suggest "generating continuous symbols" as the PCS will always generate a symbol tx_symb every transmit clock cycle. Suggest review for other mis-use of the term "code-group" when "symbol(s)" would be more appropriate.)

change "generating continuous code-group sequences" to "generating continuous symbols"

*Cl* **202** *SC* **202.1.4** *P* **162** *L* **3** # 19

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

The text says that the PCS generates a continuous stream of PAM2 symbols that are transmitted via the PMA. This is in conflict with the definition of the primitive PMA_UNITDATA.request at 202.1.3.1.1 which says that the value is PAM2 or PAM4, or zeroes (e.g. during training or QUIET period)

*SuggestedRemedy*

Change "continuous stream" to "bursts".

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

ACCEPT IN PRINCIPLE.

Consider with Comment #21.

Replace, "In both normal mode and training mode, the LS_TX PCS generates a continuous stream of PAM2 symbols that are transmitted via the PMA at one of two voltage levels (see Figure 202-26)."

with, "In both normal mode and training mode, the LS_TX PCS generates a continuous stream of symbols that are transferred to the PMA (see Figure 202-26)."

*Cl* **202** *SC* **202.1.4** *P* **162** *L* **9** # 149

Gorshe, Steve — Microchip Technology

*Comment Type* **T** *Comment Status* **D** *PHY operation*

Proposed technical changes in multiple places for completeness and to address recent discussions

*SuggestedRemedy*

See proposed technical changes in attached file 8023d0pc-202-gorshe.docx

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

PROPOSED ACCEPT IN PRINCIPLE.

TFTD.

Insert changes in file 8023d0pc-202-gorshe.docx with the following possible exceptions:
1. Don't delete "simultaneous" on P17
2. Figure 202-15 don't implement comment below as gap_time is not the same as QUIET time.
3. Table 202-10b should change TX/RX to LS/HS and change 00110, 00111, and 01000 to Reserved/Reserved.

Grant Editorial license to implement in alignment with Style.

*Cl* **202** *SC* **202.1.5** *P* **162** *L* **8** # 20

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

*Comment Type* **T** *Comment Status* **D** *Terminology*

The text says HS_PATH PCS generates continuous code-group sequences that the PMA transmits. Is this correct? I thought the TDD bursts were separated by the PCS, with the PMA not transmitting in between.

*SuggestedRemedy*

change "generating continuous code-group sequences" to "generating bursts of code-group sequences"

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

PROPOSED ACCEPT IN PRINCIPLE.

TFTD. Consider with Comment #18.

(Editor's Note: The term code-group has been carried forward since clause 96 where the PMA received code-groups, however clause 96 actually defines code-group transfer to PMA as tx_symb_vector and a code-group is a "pair of ternary symbols". Now clause 202 transfers 1 symbol at a time from PCS to PMA, so suggest "generating continuous symbols" as the PCS will always generate a symbol tx_symb every transmit clock cycle. Suggest review for other mis-use of the term "code-group" when "symbol(s)" would be more appropriate.)

change "generating continuous code-group sequences" to "generating continuous symbols"

*Cl* **202** *SC* **202.1.5** *P* **162** *L* **26** # 21

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

*Comment Type* **T** *Comment Status* **D** *PCS*

The text says that the PCS generates a continuous stream of PAM2 or PAM4 symbols that are transmitted via the PMA. This is in conflict with the definition of the primitive PMA_UNITDATA.request at 202.1.3.1.1 which says that the value is PAM2 or PAM4, or zeroes (e.g. during training or QUIET period)

*SuggestedRemedy*

Change "continuous stream" to "bursts".

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

PROPOSED ACCEPT IN PRINCIPLE.

TFTD. Consider with Comment #19.

(Editor's Note: The PCS does generate a continuous stream of symbols (tx_symb), so the sentence could be changed to remove PAM2 and mention of voltage levels.)

*Cl* **202** *SC* **202.2.1.1.1** *P* **165** *L* **8** # 22

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

*Comment Type* **T** *Comment Status* **D** *PHY operation*

SEND_N is defined as representing the XGMII data stream. According to the PHY control state diagram, it represents the TDD bursting of the XGMII data stream, including Z (0, or QUIET) symbols. Other parts of the text (see other comments) suggest that SEND_Z is sent during TDD quiet periods.

*SuggestedRemedy*

Change "representing an XGMII data stream in the data mode." to "representing the TDD bursting (including QUIET periods) of an XGMII data stream in the data mode."

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

PROPOSED ACCEPT.

TFTD.

(Editor's note: It doesn't hurt to say this, but it's unclear why it's needed. In other clauses, the similar description of SEND_N is typically describing the useful information delivered as a service provided (IE the XGMII, GMII or MII). If it's important to mention everything symbols can represent, we should also include RS-FEC parity symbols, OAM bits, refresh header, etc.)

*Cl* **202** *SC* **202.2.1.1.1** *P* **165** *L* **18** # 244

Wang, Frank — Realtek Semiconductor Corp.

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

To align with clause 201, using the definition of "Z".

*SuggestedRemedy*

change "This value is continuously asserted in case transmission of zero symbols is required." to "This value is continuously asserted in case transmission of Z symbols is required. See 202.5.2.4 for the encoding of "Z"."

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

ACCEPT IN PRINCIPLE.

change "This value is continuously asserted in case transmission of zero symbols is required."

to "This value is continuously asserted in case transmission of Z symbols is required. See 202.5.2.4 for the encoding of Z."

*Cl* **202** *SC* **202.2.1.1.1** *P* **165** *L* **19** # 189

Muma, Scott — Microchip

*Comment Type* **T** *Comment Status* **A** *Send Z*

Various changes on SEND_Z are required to clarify that it is only used in the case no TDD bursts are being sent and continuous transmission of Z symbols is required. Also changing the symbol from 0 to Z is useful and showing that during TDD bursts a fixed number of Z's will be transmitted in the TDD interval depending on the N_r and N_p in use.

*SuggestedRemedy*

See attached 8023d0pc-202_202.3.5_sendz_changes.doc and P8023dm_D0pc_bit_order_figure_markup.pdf

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

ACCEPT IN PRINCIPLE.

Entered as 201.2.2.1.1, P70L10.
Corrected to 202.2.1.1.1, P165L19.

Insert changes related to Send Z in file 8023d0pc-202_202.3.5_sendz_changes.doc.

Grant Editorial license to implement in alignment with Style.

*Cl* **202** *SC* **202.2.1.3.1** *P* **166** *L* **22** # 23

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

Suggest that nomenclature for sending quiet symbols to the transmitter be aligned with clause 201, using "Z" instead of "0" (SILENCE comment)

*SuggestedRemedy*

Change 0 to "Z" and change to "When Z symbols are to be transmitted." Add appropriate definition of Z symbols at the MDI to the PMA clause.

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

ACCEPT IN PRINCIPLE.

Accommodated by Comment #245.

*Cl* **202** *SC* **202.2.1.3.1** *P* **166** *L* **22** # 245

Wang, Frank — Realtek Semiconductor Corp.

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

To align with clause 201, using the definition of "Z".

*SuggestedRemedy*

change lines 22~25 as follows:
Z when Z symbols are to be transmitted in the following two cases:
1) when PMA_TXMODE.indication is SEND_Z during PMA training, and
2) during the QUIET period in each TDD cycle.
See 202.5.2.4 for the encoding of Z symbols.

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

ACCEPT IN PRINCIPLE.

Change lines 22-25 as follows:
Z when Z symbols are to be transmitted (see 202.5.2.4) in the following two cases:
1) when PMA_TXMODE.indication is SEND_Z during PMA training, and
2) during the QUIET period in each TDD cycle.

---

*Cl* **202** *SC* **202.2.1.3.1** *P* **166** *L* **25** # 24

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

*Comment Type* **T** *Comment Status* **R** *State diagrams*

The "QUIET" period, while it may show up as TA_Quiet in Figure 202-17, is never actually defined in the state diagrams or text. Is there something missing?

*SuggestedRemedy*

Define state diagram for TDD burst generation and timing.

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

REJECT.

This comment was WITHDRAWN by the commenter.

---

*Cl* **202** *SC* **202.2.1.4.1** *P* **166** *L* **46** # 25

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

There are no values given for rx_symb.

*SuggestedRemedy*

Insert "The rx_symb may take on the same values defined for tx_symb in 202.2.1.3.1." as new last sentence of last paragraph of 202.2.1.4.1 (P166 L46)

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

ACCEPT.

---

*Cl* **202** *SC* **202.2.1.8.2** *P* **169** *L* **3** # 26

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

typo

*SuggestedRemedy*

change "requent" to "request"

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

ACCEPT.

---

*Cl* **202** *SC* **202.2.1.10** *P* **169** *L* **32** # 147

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

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

Content has been added to address all TBDs in clause 202.

*SuggestedRemedy*

Delete all occurances of "TBD" clause 202. Grant Editor's license to work with TDD champion to determine appropriate insertion text as needed for grammatical and technical correctness.

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

ACCEPT.

---

*Cl* **202** *SC* **202.2.1.10** *P* **169** *L* **35** # 27

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

The parameter detect_lp_burst is shown going from PMA Receive to PHY Control and PCS in the diagrams, but does not appear anywhere in the PCS text. It only shows up being used one place in the PHY control state diagram, and its generation is not specified in the PMA Receive text or state diagram.

*SuggestedRemedy*

delete "PCS Receive function" (at line 36 and line 46) and remove conneciton of this parameter to the PCS Receive function in Figures 202-1 and 202-3. (or add use of this to the PCS.),
Add definition of how detect_lp_burst is set to the PMA_Receive section.

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

ACCEPT IN PRINCIPLE.

See comment #17.

At P207L51 add, "The PMA Receive generates the detect_lp_burst signal, which is set to TRUE when the PMA detects reception of PAM2 symbols at the start of a burst and set to FALSE when the PMA detects the QUIET portion of the burst."

*Cl* **202** *SC* **202.3.2** *P* **170** *L* **15** # 28

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

If I understand TDD operation correctly, the PCS transmit and receive functions, like the PMA transmit and receive are NOT simultaneous.

*SuggestedRemedy*

Delete "simulataneous and"

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

REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **202** *SC* **202.3.2.1** *P* **171** *L* **14** # 29

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

the MultiGBASE-T1 PCS reset bit is 3.2322.15 - no need for the TBD

*SuggestedRemedy*

Delete (TBD)

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

ACCEPT.

*Cl* **202** *SC* **202.3.2.2** *P* **171** *L* **33** # 30

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

*Comment Type* **T** *Comment Status* **D** *PCS*

Figure 202-4 is not the PCS transmit function block diagram - it is only a subset. Where are the interfaces (XGMII)? Where is the RS-FEC encoder? Where do Dn[0]and Dn[1] come from (they are combined and used in the scrambler as shown here, but where do they come from? - they are probably the c_i out of the RS-FEC encoder, but this is neither said nor shown.)
More importantly, the diagram shows "TDD control" muxing the data bits from teh scrambler and the silent (0, or "Z") symbols. This, as the most important functional feature needs explanation including an obvious change in bit rate through this diagram.

*SuggestedRemedy*

Redraw Figure 202-4 showing service interfaces to the PCS, XGMII and PMA service interface and all blocks in the data path. Moreover, show buffering or speed shifts for the PCS rate, which must be necessary for the TDD control to function. I am willing to help, but the specification is not sufficiently complete for me to offer a correct alternative at this time.

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

PROPOSED ACCEPT IN PRINCIPLE.

TFTD.

(Editor's Note: Considering the updates to Figures 202-5 and 202-6, the TDD champion proposes working towards removing Figure 202-4 as it is a redundant, but incomplete, version of information already provided in the text and other figures. If consensus is that Figure 202-4 is useful to maintain, then the functional blocks could be added and the diagram improved, but the additional details of buffering and clock domain crossing seems best left to specific implementations.)

*Cl* **202** *SC* **202.3.2.2** *P* **171** *L* **43** # 31

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

What does the dashed line around 'selectable precoder' block in Figures 202-4 and 202-6 mean? There is an editor's note saying to check figures. I think this should be removed, since it has been removed from the text.

*SuggestedRemedy*

Delete selectable precoder block and dashed line around it in figure 202-4 and figure 202-6.

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

ACCEPT IN PRINCIPLE.

Accomodated by Comment #246.

*Cl* **202** *SC* **202.3.2.2** *P* **171** *L* **43** # 246

Wang, Frank — Realtek Semiconductor Corp.

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

There is no selectable precoder in clause 202 now.

*SuggestedRemedy*

For Figure 202-4, remove the "selectable precoder" block and connect the output of "Gray mapping" block to the input of "PAM4 mapper" block.
The same modification should be applied to Figure 202-6, too.

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

ACCEPT IN PRINCIPLE.

For Figure 202-4, remove the "selectable precoder" block (including the dashed line) and connect the output of "Gray mapping" block to the input of "PAM4 mapper" block.

The same modification should be applied to Figure 202-6, too.

Grant Editorial license to find/remove any precoder mentions, amend diagrams appropriately, or note lack of use if necessary.

*Cl* **202** *SC* **202.3.2.2** *P* **171** *L* **48** # 247

Wang, Frank — Realtek Semiconductor Corp.

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

To align with clause 201, using the definition of "Z".

*SuggestedRemedy*

For Figure 202-4, change '0' to 'Z'

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

ACCEPT IN PRINCIPLE.

Accomodated by Comment #32.

*Cl* **202** *SC* **202.3.2.2** *P* **171** *L* **51** # 32

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

"0" is a bit, "Z" is silent. See prior comment on 202.2.1.3.1 (marked "SILENCE comment")

*SuggestedRemedy*

Change "0" to "Z" if prior comment on 202.2.1.3.1 is accepted for nomenclature of silent. This also occurs at P172 L32. (202.3.2.2 description of SEND_Z)

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

ACCEPT IN PRINCIPLE.

Change '0' to Z

Change, "shall pass a vector of zeros"

to, "shall pass a vector of Z symbols"

*Cl* **202** *SC* **202.3.2.2** *P* **172** *L* **7** # 33

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

The way I understand it, the PCS controls the PMA sublayers alternation between transmit and receive, This paragraph suggests that the PMA and PCS are fully independent, with the PCS just passing data continuously to the PMA. That obscures the TDD functionality which is in the PCS.

*SuggestedRemedy*

Insert, new final sentence (after "format."): " The PCS passes and receives bursts of data over the PMA service interface, interspersed with quiet periods (Z symbols) to effect an alternation between PMA transmit and PMA receive in a TDD cycle."

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

ACCEPT IN PRINCIPLE.

Insert, new sentences (after "format.") as follows:
"In each TDD cycle, the transmit PCS generates a sequence of PAM symbols followed by a sequence of Z symbols representing the QUIET period to the transmit PMA. The transmit QUIET period allows the receive PMA to receive a burst during each TDD cycle."

*Cl* **202** *SC* **202.3.2.2** *P* **172** *L* **11** # 34

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

"forms the input to the RS_FEC(130,124) which adds." missing word - "encoder" and RS_FEC should be RS-FEC

*SuggestedRemedy*

change "RS_FEC(130,124) which " to "RS-FEC(130,124) encoder which "

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

ACCEPT IN PRINCIPLE.

change "RS_FEC(130,124) which "

to "RS-FEC(130,124) encoder, which "

*Cl* **202** *SC* **202.3.2.2** *P* **172** *L* **17** # 248

Wang, Frank — Realtek Semiconductor Corp.

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

According to https://www.ieee802.org/3/dm/public/0126/muma_3dm_01_0126.pdf, some numbers are not updated yet.

*SuggestedRemedy*

change "L × 64 parity bits" to "L × 48 parity bits"

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

ACCEPT.

*Cl* **202** *SC* **202.3.2.2** *P* **172** *L* **19** # 35

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

The text here is repetitive for 2.5G/5G and 10G, which could be improved for clarity, since the number of bits scrambled (as a function of L) is identical in both cases.

*SuggestedRemedy*

Change P172 L18 through 22 ("L =1 for 2.5 Gb/s." through ".PAM4 symbol.") to read: "For 2.5 Gb/s, L=1, for 5 Gb/s, L=2, and for 10 Gb/s, L=4. The resulting L x 1024 x 25 bits are then scrambled. For 2.5 Gb/s and 5 Gb/s, these bits are then mapped, one at a time into a PAM2 symbol. For 10 Gb/s, they are mapped two at a time into a PAM4 symbol.:

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

ACCEPT IN PRINCIPLE.

Change P172 L18 through 22 ("L =1 for 2.5 Gb/s . a PAM4 symbol.") to read:

"L=1 for 2.5 Gb/s, L=2 for 5 Gb/s, and L=4 for 10 Gb/s. The resulting L x 1024 x 25 bits are then scrambled. For 2.5 Gb/s and 5 Gb/s, these bits are then mapped, one at a time into a PAM2 symbol. For 10 Gb/s, they are mapped two at a time into a PAM4 symbol."

*Cl* **202** *SC* **202.3.2.2** *P* **172** *L* **25** # 36

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

The text here describes a continuous flow of PAM2 or PAM4 symbols from the PCS to the PMA. That is only true during the TDD burst.

*SuggestedRemedy*

Change the start of the sentence at L25 to read "In each symbol period of a TDD burst, when communicating."
Add new 2nd sentence (after "request primitive.") : "Between TDD bursts, the PCS Transmit transfers Z symbols to the PMA via the PMA_UNITDATA.request primitive."

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

ACCEPT IN PRINCIPLE.

(Editor's note: Proposed wording is missing the refresh header.)

Insert the following new sentence at the start of the paragraph on line 25, "For both LS_TX and HS_TX, each set of transmit data-units forming the payload of a TDD burst are preceded by a PAM-2 mapped refresh header sequence of N_r symbols and followed by a sequence of N_z Z symbols to complete the TDD cycle."

Change the start of the sentence at L25 to read "In each symbol period of a TDD burst, when communicating."

Add new sentence (after "request primitive.") : "Between TDD bursts, the PCS Transmit transfers Z symbols to the PMA via the PMA_UNITDATA.request primitive."

*Cl* **202** *SC* **202.3.2.2** *P* **172** *L* **32** # 249

Wang, Frank — Realtek Semiconductor Corp.

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

To align with clause 201, using the definition of "Z".

*SuggestedRemedy*

change "pass a vector of zeros" to "pass a vector of Z symbols"

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

ACCEPT IN PRINCIPLE.

Accomodated by Comment #32.

*Cl* **202** *SC* **202.3.2.2** *P* **172** *L* **32** # 37

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

The modes SEND_Z, SEND_TA, and SEND_TS are only used during training. (according to PHY control, SEND_N is used in data mode). The text should say this, as it is giving introductory information of how the PCS transmit works.

*SuggestedRemedy*

Insert "During training, PMA_TXMODE.indication has values SEND_Z, SEND_TS, and SEND_TA, before transitioning to SEND_N for data mode." after "PHY Control function."

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

ACCEPT IN PRINCIPLE.

Insert "During training, PMA_TXMODE.indication has values SEND_Z, SEND_TS, and SEND_TA before transitioning to SEND_N for data mode." after "PHY Control function."

*Cl* **202** *SC* **202.3.2.2.1** *P* **173** *L* **14** # 38

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

the text says ENCODE and DECODE work according to the rules in 202.3.2.2.2, but there are no rules there (this was an error in earlier text, discovered in dg). Since the ENCODE and DECODE functions produce & interpret the 64B/65B blocks, the rules for blocks are indicated. These are in 202.3.2.2.4 (Block structure),

*SuggestedRemedy*

Change 202.3.2.2.2 to 202.3.2.2.4

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

ACCEPT IN PRINCIPLE.

Change 202.3.2.2.2 to 202.3.2.2.4 in the following locations:

P173, L14
P200, L16
P200, L20

*Cl* **202** *SC* **202.3.2.2.2** *P* **174** *L* **30** # 184

Muma, Scott — Microchip

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

The intent of this figure has expanded beyond bit ordering to also show the payload transmitted in a burst. It may help to also show the refresh header and quiet symbols transmitted to illustrate the complete TDD cycle.

*SuggestedRemedy*

See attached PDF P8023dm_D0pc_bit_order_figure_markup.pdf Figure 202-5

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

ACCEPT IN PRINCIPLE.

Insert changes in P8023dm_D0pc_bit_order_figure_markup.pdf Figure 202-5

Grant Editorial license to implement in alignment with Style, including adding a call-out to the figure.

*Cl* **202** *SC* **202.3.2.2.2** *P* **174** *L* **30** # 39

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

After the PAM symbols are created on both Figure 202-5 and 202-6, the figure indicates that this is the PMA service interface. The figure needs to show the insertion of the quiet (Z) symbols prior to the PMA service interface to form a TDD burst.

*SuggestedRemedy*

Add step of inserting the quiet symbols (a mux with the RS-FEC frame and a "Z" on the other input) and then show as the last line the output of the mux as a TDD burst with the correct number of PAM symbols and quiet symbols. Do this for both Figures 202-5 and 202-6

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

ACCEPT IN PRINCIPLE.

Accommodated by Comment #184 & #185.

*Cl* **202** *SC* **202.3.2.2.2** *P* **175** *L* **24** # 40

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

*Comment Type* **T** *Comment Status* **D** *PCS*

Since the TDD is a multirate PHY, show a demux at the place where the 2.5/5 Gb/s path diverges from the 10 Gb/s path with the control being the speed selection.

*SuggestedRemedy*

See comment.

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

PROPOSED ACCEPT IN PRINCIPLE.

Consider with Comment #185.

*Cl* **202** *SC* **202.3.2.2.2** *P* **175** *L* **30** # 185

Muma, Scott — Microchip

*Comment Type* **T** *Comment Status* **D** *PCS*

The intent of this figure has expanded beyond bit ordering to also show the payload transmitted in a burst. It may help to also show the refresh header and quiet symbols transmitted to illustrate the complete TDD cycle.

*SuggestedRemedy*

See attached PDF P8023dm_D0pc_bit_order_figure_markup.pdf Figure 202-6

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

PROPOSED ACCEPT IN PRINCIPLE.

Consider with Comment #40.

Insert changes in P8023dm_D0pc_bit_order_figure_markup.pdf Figure 202-6

Grant Editorial license to implement in alignment with Style, including adding a call-out to the figure.

*Cl* **202** *SC* **202.3.2.2.6** *P* **178** *L* **46** # 41

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

Remote fault is used by the link fault state diagram, Figure 46-11 in response to receiving a local fault. Do not delete..

*SuggestedRemedy*

Delete editor's note at 202.3.2.2.6

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

ACCEPT.

*Cl* **202** *SC* **202.3.2.2.12** *P* **180** *L* **3** # 42

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

Tx_coded is a variable name and should not be capitalized.

*SuggestedRemedy*

change "Tx_coded<0> contains" to "The bit tx_coded<0> contains"

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

ACCEPT.

*Cl* **202** *SC* **202.3.2.2.12** *P* **180** *L* **3** # 43

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

There is no "transcoder". The blocks shown are simply the encoded 65B blocks concatenated. Where the text said transcoder it clearly means RS-FEC encoder.

*SuggestedRemedy*

Change "to the transcoder" to "to the RS-FEC encoder" in 202.3.2.2.12 (P180 L3).

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

ACCEPT.

*Cl* **202** *SC* **202.3.2.2.13** *P* **180** *L* **7** # 44

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

We jump directly from tx_coded, a 64B/65B block to "The resulting RS-FEC frame." - the definition of tx_group and aggregation are a long ways away back in 202.1.3.1.

*SuggestedRemedy*

Insert new first sentence in 202.3.2.2.13: "Fifteen of 65B blocks (tx_coded) are grouped together to form tx_group15x65B as described in 202.1.3.1."
Replace the first sentence of the first paragraph of 202.3.2.2.13 with "For LS_TX transmission, tx_group15x65B, followed by the 17-bit
OAM/Reserved field, and 48 parity bits are grouped to form an RS-FEC frame of 1040 bits."
Replace the first sentence of the second paragraph of 202.3.2.2.13 with "For HS_TX transmission, tx_group15x65B, followed by the 1-bit
OAM/Reserved field, and 48 parity bits are grouped to form an RS-FEC frame of 1024 bits."

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

ACCEPT IN PRINCIPLE.

Insert new first sentence in 202.3.2.2.13: "Fifteen of 65B blocks (tx_coded) are grouped together to form tx_group15x65B as described in 202.1.3.1."

Replace the first sentence of the first paragraph of 202.3.2.2.13 with "For LS_TX transmission, tx_group15x65B, followed by the 17-bit OAM/Reserved field and 48 parity bits, forms an RS-FEC frame of 1040 bits."

Replace the first sentence of the second paragraph of 202.3.2.2.13 with "For HS_TX transmission, tx_group15x65B, followed by the 1-bit OAM/Reserved field and 48 parity bits, forms an RS-FEC frame of 1024 bits."

*Cl* **202** *SC* **202.3.2.2.14** *P* **180** *L* **26** # 45

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

The text says <x speed> "mode supports L = " - Are other values of L allowed? It seems that a requirement is needed here as to which value of L is used.

*SuggestedRemedy*

Change "supports" to "shall use" for all four speeds (lines 26 to 32). Alternatively, replace lines 24 to 32 with: "The value of L used depends on the speed mode, and shall comply with Table 202-x." (and add table 202-x with 2 columns:
Speed mode | Interleave depth (L)
100 Mb/s | 1
2.5 Gb/s | 1
5 Gb/s | 2
10 Gb/s | 4

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

ACCEPT IN PRINCIPLE.

P180L20 change "speed" to "data rate". Editor to correct this throughout Clause 202.

Replace lines 26 to 32 with: "The value of L used depends on the data rate, and shall comply with Table 202-x."

Add table 202-x with 2 columns:
Data rate | Interleave depth (L)
100 Mb/s | 1
2.5 Gb/s | 1
5 Gb/s | 2
10 Gb/s | 4

*Cl* **202** *SC* **202.3.2.2.15** *P* **180** *L* **47** # 130

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

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

Shown be "an" before an "H".

*SuggestedRemedy*

Replace, "...operates as a HS_RX."

with "...operates as an HS_RX."

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

ACCEPT.

*Cl* **202** *SC* **202.3.2.2.16** *P* **181** *L* **27** # 46

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

The text spells out the RS-FEC message symbols separately for the LS PATH and the HS PATH; however, it uses a variable "k" in each definition, and then defines the values of k. Using the value in the descriptions and nomenclature will improve clarity.

*SuggestedRemedy*

Replace "k" on line 27 with 124, and replace (130-k) on line 27 with 6.
Replace "k" on line 30 with 122, and "(128-k) on line 31 with 6.
Replace "RS-FEC(n,k)" at line 33 through the end of the paragraph ("HS_PATH" at line 34) with:
"RS-FEC(130,124) for the LS_PATH and RS-FEC(128, 122) for the HS_PATH."

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

ACCEPT.

*Cl* **202** *SC* **202.3.2.2.16** *P* **181** *L* **28** # 47

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

RS FEC message should be RS-FEC message

*SuggestedRemedy*

See comment

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

ACCEPT.

*Cl* **202** *SC* **202.3.2.2.17** *P* **183** *L* **42** # 48

Zimmerman, George CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

All of a sudden the text jumps to description of a refresh header. It needs some introduction first if it goes here (and the whole TDD frame structure probably needs to go up front before the scrambler) but perhaps the section can be rewritten without refresh frame.

*SuggestedRemedy*

Change "PAM2 encoding is used for the refresh header (see 202.3.5) at all symbol rates. Consequently, the scrambled
header data stream, Cn, is shown in Equation (202-4)." to "Different scramblers are used for the refresh header and for the data stream.
The scrambled PAM2 header data stream, Cn shall be as in Equation (202-4). "

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

ACCEPT IN PRINCIPLE.

(Editor's note: Best to always call it refresh header and payload since the payload is sometimes training frames and sometimes RS-FEC frames. Also, Cn is a bit stream prior to PAM2 mapping, not a PAM2 symbol stream.)

Change "PAM2 encoding is used for the refresh header (see 202.3.5) at all symbol rates. Consequently, the scrambled header data stream, Cn, is shown in Equation (202-4)."

to "Different scramblers are used for the refresh header and for the burst payload. The scrambled refresh header data bit, Cn, shall be as in Equation (202-4). Refresh header data bits are mapped to PAM2 symbols for all data rates."

*Cl* **202** *SC* **202.3.2.2.17** *P* **184** *L* **14** # 49

Zimmerman, George CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

The paragraph beginning at line 15 should be part of the previous paragraph, since it also only applies to 10 Gb/s transmission.

*SuggestedRemedy*

see comment.

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

ACCEPT.

*Cl* **202** *SC* **202.3.2.2.19** *P* **185** *L* **1** # 50

Zimmerman, George CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

*Comment Type* **E** *Comment Status* **D** *precoder*

Now that there is no precoder, you might as well do the gray-coding and encoding as one step. 202.3.2.2.19 is unnecessary.
Also, the output that goes to the TDD control is called Tn according to Figure 202-4. This makes Gn, and Mn both unnecessary notation.

*SuggestedRemedy*

Delete 202.3.2.2.19 (P185 L1 through 22)
Change references to G(n) on P184 L31 and L39 to T(n).
Change 0, 1, 2, 3 on P184 L32-37 and L41-45 to -1, -1/3, +1/3, and +1 respectively.
In Figure 202-4, Change "Gray mapping" to "Gray mapping PAM4 encoder", delete PAM4 mapper, and delete label of Gn.

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

PROPOSED ACCEPT IN PRINCIPLE.

(Editor's note: If the Gray mapping and PAM4 mapping are merged, this needs to be updated here and in all the diagrams. There isn't opposition to the idea as it will make the PAM2 and PAM4 datapaths more aligned, but there are a lot more changes to do than what is noted beyond P184/185 and Figure 202-4. Figure 202-6 and Figure 202-11 also need updating and the whole clause should be checked for alignment of Gray/PAM4 mapping occurrences to the terms.)

Delete 202.3.2.2.19 (P185 L1 through 22)

Change references to G(n) on P184 L31 and L39 to T(n).

Change 0, 1, 2, 3 on P184 L32-37 and L41-45 to -1, -1/3, +1/3, and +1 respectively.

In Figure 202-4, Change "Gray mapping" to "Gray mapping PAM4 encoder", delete PAM4 mapper, and delete label of Gn.

Grant Editorial license to work with the TDD champion to update Figure 202-6 and Figure 202-11, as well as align occurences of Gray/PAM4 mapping to terms in clause 202.

*Cl* **202** *SC* **202.3.2.3** *P* **185** *L* **35** # 51

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

What does "including compliance with the associated state variable as specified in 202.3.7.2.2" mean? You can't comply with a variable. Conforming with the state diagram (Figure 202-21) is enough.

*SuggestedRemedy*

Delete "including compliance with the associated state variable as specified in 202.3.7.2.2."

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

REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **202** *SC* **202.3.2.3** *P* **185** *L* **40** # 52

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

"descrambling is performed according to rules." - what does this mean? Having unreferenced or undefined rules is meaningless. This appears to be specified in the clause, so deleteing the phrase is fine.

*SuggestedRemedy*

delete "according to rules."

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

ACCEPT.

*Cl* **202** *SC* **202.3.2.3** *P* **185** *L* **46** # 53

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

"In each burst,". no burst structure has been defined yet. It appears this is referring to the number of bits in a L-interleaved superframe (which may be the same as a burst, but at that's actually something that has been defined already).

*SuggestedRemedy*

Delete "In each burst, " Or have a discussion of the burst structure with regards to bits, superframe length, and OAM bits before this.

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

REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **202** *SC* **202.3.2.3** *P* **185** *L* **49** # 54

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

"This process" has no precedent. I assume it is referring to the PCS Receive function, not a process.

*SuggestedRemedy*

Replace "This process" with "The PCS Receive function"

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

ACCEPT IN PRINCIPLE.

(Editor's note: A step is missing in the description compared to the Figure 202-10 and Figure 202-11. Confirm if this is a process or a function.)

Replace "This process..."

with "Groups of 15 64/65B are then separated into individual 64/65B blocks. The PCS Receive function..."

*Cl* **202** *SC* **202.3.2.3** *P* **185** *L* **53** # 55

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

*Comment Type* **T** *Comment Status* **D** *PCS*

The text describes adapting between PMA and XGMII rates, but they are NEVER synchronized, and, as I understand it, the PCS doesn't just adjust by inserting/deleting idles & sequence ordered sets, but also deletes the inter-burst gaps, nowhere does it describe recombining bursts. This seems an appropriate place.

*SuggestedRemedy*

Change at P184 L51 "Where the XGMII and PMA sublayer data rates are not synchronized, the receive process inserts idles..." to
"Because the received data stream is divided into TDD bursts, with silence interspersed, the PCS receive function recombines separated bursts before passing to the XGMII. Where the XGMII and the PMA sublayer transmit clocks are not frequency synchronized, the PCS receive process also inserts idles..."

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

PROPOSED REJECT.

(Editor's note: Recommend reject/withdraw given the removal of burst overhead will be covered by Comment #53. In the flow of the text, we are at the XGMII interface, so going back to talk about things that were removed at that point is confusing. The point of the sentence is just that if RX_CLK is not rate-matched to the XGMII data already then it is necessary to insert/delete to achieve rate-matching of the XGMII data to the RX_CLK. If RX_CLK is already rate-matched to the XGMII data then nothing is required."

*Cl* **202** *SC* **202.3.2.3** *P* **186** *L* **7** # 250

Wang, Frank — Realtek Semiconductor Corp.

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

wording

*SuggestedRemedy*

remove "(TBD)"

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

ACCEPT.

*Cl* **202** *SC* **202.3.2.3** *P* **186** *L* **14** # 56

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

The paragraph break between the monitoring of loc_rcvr_status and what loc_rcvr_status does isn't necessary and reduces clarity

*SuggestedRemedy*

Delete paragraph break at P186 L14

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

ACCEPT.

*Cl* **202** *SC* **202.3.2.3** *P* **187** *L* **1** # 57

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

*Comment Type* **E** *Comment Status* **D** *PCS*

In Figure 202-10 and 202-11 show where the TDD bursts are delineated, refresh headers are stripped and bursts are combined. These are necessary for completeness.

*SuggestedRemedy*

See comment

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

PROPOSED ACCEPT IN PRINCIPLE.

(Editor's note: Editors agree and note that Scott Muma provided suggested changes for Figures 202-5 and 202-6. Scott offered to revise Figure 202-10 and 202-11 according to the comment.

Grant Editor's license to work with TDD champion to revise Figure 202-10 and 202-11 according to the comment and conform to Style.

*Cl* **202** *SC* **202.3.2.3.1** *P* **189** *L* **3** # 58

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

*Comment Type* **T** *Comment Status* **D** *PCS*

The RECEIVE PCS doesn't form PAM2 streams. See prior comment where the values of rx_symb, passed byt PMA_UNITDATA.indication are not defined. Generally, the PMA would receive PAM2 and pass the values to the PCS, and generally these would be the same format as the PMA_UNITDATA.request (tx_symb)... It seems the purpose of this paragraph is to say that requests are concatenated. It also doesn't concatenate requests - it concatenates the rx_symb values conveyed by the indications. Finally, the Figure referenced for 10Gb/s is incorrect (Fig 202-10 is the LS_RX figure...)

*SuggestedRemedy*

Replace first paragraph of 202.3.2.3.1 with:
"When operating in 100 Mb/s, 2.5 Gb/s, or 5 Gb/s data mode, the receiving PCS shall concatenate rx_symb values conveyed by the PMA_UNITDATA.indication in order from rx_PAM2_0 to rx_PAM2_1023 (see Figure 202-10 for LS_RX or Figure 202-11 for HS_RX). When operating in 10 Gb/s data mode, the receiving PCS shall shall concatenate rx_symb values conveyed by the PMA_UNITDATA.indication in order from rx_PAM4_0 to rx_PAM4_511 (see Figure 202-11)."

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

PROPOSED ACCEPT IN PRINCIPLE.

TFTD.

(Editor's note: Editors agree. However, a section before this on the whole burst is likely needed to align with Comment #57 changes. This step follows removal of refresh_hdr and QUIET.)

*Cl* **202** *SC* **202.3.2.3.2** *P* **189** *L* **17** # 59

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

Equation (202-6) and Equation (202-5) are not the scrambler polynomials. They are also not active cross references.

*SuggestedRemedy*

Make "Equation (202-6)" an active cross-reference to Equation (202-10) and "Equation (202-5)" an active cross-reference to Equation (202-9)

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

ACCEPT.

*Cl* **202** *SC* **202.3.3** *P* **189** *L* **39** # 60

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

Figures 202-5 and 202-6 are the bit ordering, they don't show TDD bursts.Not clear whether there is a missing figure, but I can't find one showing TDD bursts that might be meant to be indicated. Perhaps the word "TDD bursts" is incorrect.

The same issue exists in teh receiver description on line 43

*SuggestedRemedy*

delete "TDD bursts" (in 2 locations) or add new figures showing what is meant.

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

REJECT.

Comment #150 adds TDD bursts/cycle handling to the figure.

*Cl* **202** *SC* **202.3.3** *P* **189** *L* **45** # 61

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

*Comment Type* **T** *Comment Status* **D** *RS-FEC*

I don't think the output of the RS-FEC decoder should also be zero, because it representes SCRAMBLED zeros. It can't be zero and have the received descrambled values be zero unless the descrambler is off.

*SuggestedRemedy*

Change "The output of the RS-FEC decoder should also be zero." to "The output of the RS-FEC decoder should represent scrambled zeros."

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

PROPOSED REJECT.

The Editors disagree with the Commenter. The functional order is: RS-FEC encoder, scrambler, descrambler, RS-FEC decoder. Since the input to the RS-FEC encoder and scrambler is zeros, the output of the descrambler and RS-FEC decoder should also be zeros.

*Cl* **202** *SC* **202.3.3** *P* **189** *L* **46** # 62

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

The sentence that "However, there is a possibility that the RS-FEC decoder corrected some errors." isn't relevant. It is unclear what this is supposed to mean.

*SuggestedRemedy*

Delete "However, there is a possibility that the RS-FEC decoder corrected some errors."

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

PROPOSED ACCEPT IN PRINCIPLE.

(Editor's note: This is just differentiaing between the behavior that bit errors cause the descrambler output to be not all zeros but the RS-FEC decoder output might still be all zeros even in the presence of bit errors. It's a helpful hint from Cl149, but not changing anything whether it's there or not.)

Delete "However, there is a possibility that the RS-FEC decoder corrected some errors."

discussion with the editors on the purpose suggests an alternative wording:

“In the absence of errors in PMA Receive, the descrambler output should be zeros. The output of the RS-FEC decoder should also be zeros, and may correct errors in the descrambler output. Any nonzero values at the output of the RS-FEC decoder are due to uncorrectable RS-FEC frames.”

*Cl* **202** *SC* **202.3.3** *P* **189** *L* **47** # 251

Wang, Frank — Realtek Semiconductor Corp.

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

wording

*SuggestedRemedy*

remove "(TBD)"

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

ACCEPT IN PRINCIPLE.

Accomodated by Comment #63.

*Cl* **202** *SC* **202.3.3** *P* **189** *L* **47** # 63

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

The test mode is in fact Test Mode 7, the TBD is unnecessary.

*SuggestedRemedy*

Delete (TBD) at P189 L46

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

ACCEPT.

*Cl* **202** *SC* **202.3.4** *P* **189** *L* **50** # 65

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

The scrambler polynomials should be defined with the scrambler, in 202.3.2.2.17. That section already defines when 202.3.4.1 is used and when 202.3.4.2 is used. These sections should be moved up to right after202.3.2.2.17.

*SuggestedRemedy*

Delete 202.3.4
Move 202.3.4.1 and 202.3.4.2 after 202.3.2.2.17

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

ACCEPT IN PRINCIPLE.

Implement the suggested remedy and correct any references to 202.3.4.

*Cl* **202** *SC* **202.3.4** *P* **189** *L* **50** # 64

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

The TDD bursts have not been described, and are unnecessary in the descri[ption.

*SuggestedRemedy*

Replace the first sentence with "Different scrambler polynomials are used for the refresh header and the burst payload."

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

ACCEPT.

*Cl* **202** *SC* **202.3.4** *P* **189** *L* **51** # 66

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

The term "refresh_hdr" looks like a variable. It is not. It is otherwise called the "refresh header". This is the first instance, but it appears in a number of places.

*SuggestedRemedy*

Replace "refresh_hdr" with "refresh header" globally. (P189 L51 & 53, Figure 202-14, P191 L28, P192 L3, P193 L14 (Eq 202-13), P193 L29 (twice), P193 L30, Figure 202-16 (P195 L46), Figure 202-17 (P196 L14 & 25), Figure 202-18 (P197 L14 & 21) )
AND delete "(refresh_hdr)" at P191 L24.

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

ACCEPT.

*Cl* **202** *SC* **202.3.4.1** *P* **190** *L* **3** # 67

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

Duplicate shall. The requirement for the refresh header scrambling is already stated in 202.3.2.2.17

*SuggestedRemedy*

change "shall be scrambled" to "is scrambled".

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

ACCEPT.

*Cl* **202** *SC* **202.3.5** *P* **191** *L* **19** # 68

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

It seems that 202.3.5 defines the PMA TDD framing structure for both training and data mode, because it defines the SEND_N structure too. (TDD_BURST comment)

*SuggestedRemedy*

Change title of 202.3.5 to TDD Burst Structure
Replace first paragraph in 202.3.5 to read: "The PCS generates signals to be transmitted by the PMA in the form of TDD bursts. TDD burst structure depends on the value of tx_mode and the data rate of transmission. Each TDD burst is comprised of two parts, a refresh header and a payload section. During training, in addition to indicating silence with SEND_Z, the PCS transmits TDD bursts in two different formats for tx_modes SEND_TS and SEND_TA, before finally switching to SEND_N. SEND_TS uses a symmetric frame format and shall be transmitted at a 3 GBd rate, regardless of the speed selected. SEND_TA and SEND_N use an asymmetric frame format, and transmit at either 3 GBd or 6 GBd depending on the transmitter speed selected. Quiet times between transmissions are introduced between TDD bursts by the PCS, when the PCS inserts Z symbols between TDD bursts. The duration of quiet time length depends on the state of tx_mode.

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

ACCEPT IN PRINCIPLE.

Grant Editor's license to implement during incorporation of Comment #186 changes.

*Cl* **202** *SC* **202.3.5** *P* **191** *L* **20** # 174

Chini, Ahmad — Broadcom

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

Nr and Np is specified for normal modes as well as training mode in 202.3.5.1, however the normal mode frame is not descibed

*SuggestedRemedy*

1- Change the title of 202.3.5 to
PMA training and Normal frame
2- Add a new plot similar to Figure 202-14 but without info field and rename it to Normal mode frame.
3- Rewrite to include normal mode, see Chini-3dm_01b_0326.pdf

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

ACCEPT IN PRINCIPLE.

Grant Editor's license to implement during incorporation of Comment #186 changes.

*Cl* **202** *SC* **202.3.5** *P* **191** *L* **21** # 186

Muma, Scott — Microchip

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

This subclause begins with several sections describing training burst/operation, but then also goes into describing data bursts. Much of what is happening is actually leveraging or directly using PCS functions, as shown in Figure 202-4. So some parts of this description need to be moved to the PCS description and more clearly explain the SEND_N data burst generation.

*SuggestedRemedy*

See attached 8023d0pc-202_202.3.5_sendz_changes.doc

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

ACCEPT IN PRINCIPLE.

Modify content in file 8023d0pc-202_202.3.5_sendz_changes.doc to accommodate source content from the following comments:

Comment #68
Comment #71
Comment #72
Comment #75
Comment #76
Comment #174
Comment #175
Comment #176

Grant Editorial license to implement updated content and alignm with Style.

*Cl* **202** *SC* **202.3.5** *P* **191** *L* **23** # 131

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

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

Ensure that all figures, tables, and equations have a text call-out.

*SuggestedRemedy*

Replace, "...by a training payload."

with "...by a training payload as shown in Figure 202-14."

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

ACCEPT.

*Cl* **202** *SC* **202.3.5** *P* **191** *L* **25** # 69

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

Missing articles.

*SuggestedRemedy*

Change "Refresh header" to "The refresh header".
Change "Training payload" to "The training payload"

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

ACCEPT.

---

*Cl* **202** *SC* **202.3.5** *P* **191** *L* **43** # 70

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

It seems that Figure 202-14 is repeated as part of Figure 202-16. Additionally, with a little augmentation, Figure 202-14 could define all the right parameters of the training frame.

*SuggestedRemedy*

Consider deletingthe expansion in figure 202-16, and augmenting Figure 202-14 to show the location (Ninf symbol) of the InfoField. Spell out InfoField.

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

ACCEPT IN PRINCIPLE.

Delete the expansion in figure 202-16, and augment Figure 202-14 to show the location (Ninf symbol) of the Infofield. Spell out Infofield.

---

*Cl* **202** *SC* **202.3.5.1** *P* **192** *L* **1** # 176

Chini, Ahmad — Broadcom

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

The title does not include Normal mode

*SuggestedRemedy*

Rewrite title of the cluse as follows

Refresh header, training and normal payload length

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

ACCEPT IN PRINCIPLE.

Grant Editor's license to implement during incorporation of Comment #186 changes.

---

*Cl* **202** *SC* **202.3.5.1** *P* **192** *L* **3** # 175

Chini, Ahmad — Broadcom

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

Tables have normal mode numbers but text does not refer to training

*SuggestedRemedy*

Rewrite as follows

The lengths for refresh_hdr along with training and Normal mode payload are described in Table 202-5, Table 202-6, and
Table 202-7.

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

ACCEPT IN PRINCIPLE.

Grant Editor's license to implement during incorporation of Comment #186 changes.

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*Cl* **202** *SC* **202.3.5.1** *P* **192** *L* **6** # 71

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

Adding the number of quiet symbols to the tables would be very useful. Reconciling this to the times, exposed errors in the documentation of timing.

*SuggestedRemedy*

Add "Quiet symbols" column to Tables 202-5, 202-6 and 202-7. and change titles to "N_r, N_p, and N_q values for."
I believe that for 100 Mb/s N_q is 960 for SEND_TS and 27136 for SEND_TA & SEND_N;
for 2.5 Gb/s it is 960 for SEND_TS, 528 for SEND_TA & SEND_N;
for 5Gbs & 10 Gb/s it is 960 for SEND_TS and 1056 for SEND_TA & SEND_N
Add Note below Table 202-7: NOTE - SEND_TS is sent at 3 GBd whereas SEND_TA and SEND_N are at 6 GBd. N_r, N_p, and N_q are at the baud indicated for the appropriate tx_mode.

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

ACCEPT IN PRINCIPLE.

Grant Editor's license to implement during incorporation of Comment #186 changes.

*Cl* **202** *SC* **202.3.5.1** *P* **192** *L* **7** # 252

Wang, Frank — Realtek Semiconductor Corp.

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

According to https://www.ieee802.org/3/dm/public/0126/muma_3dm_01_0126.pdf, the values of Training_payload N_p(symb) for SEND_TA and SEND_N in Tables 202-5, 202-6, and 202-7 need to be updated.

*SuggestedRemedy*

For Table 202-5, change the two "1024" to "1040".
For Table 202-6, change the two "26 000" to "25 600".
For Table 202-7, change the two "52 000" to "51 200".

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

ACCEPT.

*Cl* **202** *SC* **202.3.5.2** *P* **193** *L* **1** # 72

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

The nomenclature here is unnecessarily complex. The variables aren't introduced before the tables, the names "refresh_header" and "training_payload" are only used in the tables. N_b isn't necessary - it is just N_p. N_b is only used in this subclause. Trn is also unnecessary, as it is the same as S_tn. The values of N_r and N_p are key to the frame structure and need to be clear. N_p isn't just the training payload length, it appears to be the length of the payload field regardless of whether it is in training - since the tables define it for SEND_N, which is also the format in data mode...
It also defines the parameters of the training frame without any requirement.

*SuggestedRemedy*

Change the first sentence of 202.3.5.1 (P192 L1) to "The lengths for the refresh header, N_r, and the payload field are described in Table 202-5, Table 202-6, and Table 202-7.

Replace the 1st paragraph of 202.3.5.2 wit:
"For TDD bursts, the refresh header shall be composed of eight bytes of zeros, followed by four bytes of 0xF0. The refresh header is scrambled by the PRBS11 scrambler in 202.3.4.1. The PRBS11 scrambler stops at the last bit of the refresh header and resumes at the first bit of the next refresh header.
The TDD burst is completed by N_p payload symbols following the refresh header.
The payload symbols are scrambled by the PRBS33 scrambler defined in 202.3.4.2.
Except when txmode is SEND_N transmitting at 10 Gb/s, the payload symbols are PAM2, defined by Equation 202-5. When transmitting at 10 Gb/s and tx_mode is SEND_N, the payload symbols are the output of the Gray-mapped PAM-4 encoder, specified in 202.2.2.18." (note to editor, this assumes a previous comment was accepted combining 202.2.2.18 & 19, if it is not then this should be 202.3.2.2.19)
<new paragraph>
"The contents of the training frame are specified in equation 202-12 and equation 202-13."
Delete Equation 202-11, and 202-14, and replace N_b with N_p in Equations 202-12 and 202,13.

Delete the last sentence in 202.3.5.2 (Trn[0[ is the same...) at Lines 24 & 25.
Consider combining sections 202.3.5.1 and 202.3.5.2
Delete 202.3.5.2.1 as it is now unnecessary.

Replace Trn[0] with S_tn at Figure 202-4 (P171 L33), in Equation 202-5, and in 202.3.5.3 at P193 L36. (these are the only other occurences of it - note, the 202.3.5.3 might be deleted by another comment)

Add: "NOTE - See 202.3.5.1 for definition of S_tn ." after Equation 202-5 (P184 L6)

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

ACCEPT IN PRINCIPLE.

Grant Editor's license to implement during incorporation of Comment #186 changes.

*Cl* **202** *SC* **202.3.5.2** *P* **193** *L* **3** # 138

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

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

Ensure that all figures, tables, and equations have a text call-out.

*SuggestedRemedy*

Replace "...in the training payload."

with "...in the training payload as shown in Equation (202-11)."

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

ACCEPT.

*Cl* **202** *SC* **202.3.5.2** *P* **193** *L* **4** # 139

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

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

Ensure that all figures, tables, and equations have a text call-out.

*SuggestedRemedy*

Replace "...in the training payload."

with "...in the training payload as shown in Equation (202-12)."

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

ACCEPT.

*Cl* **202** *SC* **202.3.5.2** *P* **193** *L* **4** # 253

Wang, Frank — Realtek Semiconductor Corp.

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

wording: minus sign

*SuggestedRemedy*

change "N_r - 1" to "N_r - 1"

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

ACCEPT IN PRINCIPLE.

(Editor's note: Editor is assuming the change is from "-" to an en-dash.)

change "N_r - 1" to "N_r - 1"

*Cl* **202** *SC* **202.3.5.2.1** *P* **193** *L* **31** # 73

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

"defined in (see 202.3.4.1)." should be "defined in 202.3.4.1."

*SuggestedRemedy*

see comment.

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

ACCEPT.

*Cl* **202** *SC* **202.3.5.3** *P* **193** *L* **33** # 74

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

*Comment Type* **E** *Comment Status* **D** *PCS*

202.3.5.3 is unnecessary in its entirety (P193 L33 through P194 L14), as these requirements are all elsewhere - either in the PCS scrambler (202.3.4.1) or in 202.3.5.2, and in the mapper sections.

*SuggestedRemedy*

Delete 202.3.5.3 in its entirety, including the editor's note.

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

PROPOSED ACCEPT IN PRINCIPLE.

(Editor's note: Agree that most of the section is redundant, however, equation (202-16) might need to be moved into next section if Figure 202-4 is retained.)

Grant Editor's license to implement in accordance with the resolution to maintaining or deleting Figure 202-4.

*Cl* **202** *SC* **202.3.5.3** *P* **193** *L* **49** # 141

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

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

Equation (202-15) and Equation (202-16) are missing call-outs. Technical changes to this text are anticipated, so it's not possible to propose the exact call-out at this time.

*SuggestedRemedy*

Grant Editorial license for Editor to add call-outs to Equation (202-15) and Equation (202-16) in clause 2.3.5.3 .

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

ACCEPT.

*Cl* **202** *SC* **202.3.5.4** *P* **194** *L* **16** # 75

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

This section describes the generation of TDD bursts, and insertion of the quiet symbols. It should be renamed and rewritten so as not to hide that.

*SuggestedRemedy*

Retitle 202.3.5.4 PAM Mapping and generation of TDD bursts
With text:
"Except for when transmitting payload symbols for 10 Gb/s when tx_mode is SEND_N, the symbols are encoded by the PAM2 mapper defined in 202.3.2.2.20.
When transmitting 10 Gb/s payload symbols and tx_mode is SEND_N, the symbols are encoded by the Gray-coded PAM4 encoder defined in 202.3.2.2.18 and 202.3.2.2.19.
Quiet symbols, Z, are then introduced between each TDD burst frame to form the sequence On, as defined in Equation 202-17.
The values of On are then conveyed to the PMA for transmission via the parameter tx_symb of the PMA_UNITDATA.request primitive.

Retain equation 202-17.
After equation 202-17 insert: "Where N_tdd is the number of symbols equivalent to the nominal 9.6 us TDD cycle time."

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

ACCEPT IN PRINCIPLE.

Grant Editor's license to implement during incorporation of Comment #186 changes.

*Cl* **202** *SC* **202.3.5.4** *P* **194** *L* **24** # 142

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

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

Ensure that all figures, tables, and equations have a text call-out.

*SuggestedRemedy*

Replace "...based on symbol time index n."

with "...based on symbol time index n as shown in Equation (202-17)."

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

ACCEPT.

*Cl* **202** *SC* **202.3.6** *P* **195** *L* **1** # 76

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

If we define the TDD frames in 202.3.5, it is not clear what value 202.3.6 adds, other than Table 202-8 and perhaps some informative figures. If the figures are necessary, they should be in 202.3.5

*SuggestedRemedy*

Move text and figures from P195 L2 through P197 L30 to 202.3.5, after Table 202-7. Alternatively,move only P195 L2 through P195 L34 (including first paragraph, Figure 202-15, and table 202-8) to 202.3.5, after Table 202-7, and delete the remaining content of 202.3.6.

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

ACCEPT IN PRINCIPLE.

(Editor's note: Editors agree, but feel it would be more coherent to move everything to 202.3.5 and perhaps rename section 202.3.5 PCS TDD signaling if no better naming is proposed.)

Grant Editor's license to implement during incorporation of Comment #186 changes.

*Cl* **202** *SC* **202.3.6** *P* **195** *L* **9** # 254

Wang, Frank — Realtek Semiconductor Corp.

*Comment Type* **E** *Comment Status* **D** *PCS*

wording

*SuggestedRemedy*

change "tdd_cycle_time" to "TDD_cycle_time"

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

PROPOSED ACCEPT IN PRINCIPLE.

TFTD. Consider with Comments #256 and #78.

(Editor's note: TDD_cycle_time should be should be defined in nominal terms similar to P194L35. It will be determined by (N_r+N_p+N_z)/symbol_rate, two useful examples to add:
28800 symbols / 3 Gbd = 9.6 us
57600 symbols / 6 Gbd = 9.6 us)

change "tdd_cycle_time" to "TDD_cycle_time"

*Cl* **202** *SC* **202.3.6** *P* **195** *L* **9** # 77

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

tdd_cycle_time and gap_time are not used or defined anywhere else

*SuggestedRemedy*

Please define it. - suggest add all times shown in the figure (e.g., tdd_cycle_time, and gap_time) to Table 202-8. (alternately, replace labels in the figure with defined values)

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

ACCEPT IN PRINCIPLE.

Insert,

tdd_cycle_time is the nominal 9.6us TDD cycle time.

gap_time is the time between the start of QUIET at one MDI output and end of QUIET at the other MDI output. The gap_time is a result of the alignment of the two ends, so is not specified.

---

*Cl* **202** *SC* **202.3.6** *P* **195** *L* **25** # 256

Wang, Frank — Realtek Semiconductor Corp.

*Comment Type* **E** *Comment Status* **D** *PCS*

Add an additional column, "Tdd cycle_time", to better understanding the timing in each TDD cycle.

*SuggestedRemedy*

Add 4th column "TDD_cycle_time (ns)" and a "9600" is assigned to SEND_TS, SEND_TA, and SEND_N.

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

PROPOSED ACCEPT IN PRINCIPLE.

TFTD. Consider with Comments #254 and #78.

(Editor's note: Intro text for TDD_cycle_time should be added somewhere. It should be clear it's nominal TDD cycle time, more important would be total symbols in the TDD cycle.)

---

*Cl* **202** *SC* **202.3.6** *P* **195** *L* **25** # 78

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

*Comment Type* **E** *Comment Status* **D** *PCS*

Adding the gap time to the table would make it far more useful. Checking these times revealed an error in Table 202-8.

*SuggestedRemedy*

Change title of Table 202-8 to "TDD cycle timing"
In Table 202-8:
Add column to table for gap_time with appropriate values (I think 320ns for SEND_TS, and 176 for SEND_TA and SEND_N)
Change LS_TX_time for SEND_TA & SEND_N to 554.67 ns , and HS_TX_time to 8693.33 ns

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

PROPOSED ACCEPT IN PRINCIPLE.

(Editor's note: The refresh header, payload, and QUIET times/symbol counts will be specified. The gap time is not a strictly controlled value since it depends on the alignment of the two ends (it will always have a range)).

Consider with Comments #254 and #78.

---

*Cl* **202** *SC* **202.3.6** *P* **195** *L* **25** # 255

Wang, Frank — Realtek Semiconductor Corp.

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

According to https://www.ieee802.org/3/dm/public/0126/muma_3dm_01_0126.pdf, the values of LS_TX_time and HS_TX_time in Table 202-8 need to be updated.

*SuggestedRemedy*

change "560" to "554.67" and change "8826.67" to "8693.33"

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

ACCEPT.

*Cl* **202** *SC* **202.3.6** *P* **195** *L* **32** # 188

Muma, Scott — Microchip

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

The times in SEND_TA/SEND_N are not updated in Table 202-8

*SuggestedRemedy*

Change 560 to 554.67
Change 8826.67 to 8693.33

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

ACCEPT IN PRINCIPLE.

Accommodated by Comment #255.

*Cl* **202** *SC* **202.3.6** *P* **195** *L* **37** # 79

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

TS_Quiet doesn't show up anywhere else it needs definition. Is this the TDD_on_s timer value?

*SuggestedRemedy*

Please replace with QUIET or appropriate term and define its duration.

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

ACCEPT IN PRINCIPLE.

Grant Editor's license to replace with "QUIET (N_z)" to illustrate that the QUIET will be for N_z symbols that will be added to tables 202-5/6/7. Note that the parameters for SEND_TS are used for N_r, N_p, N_z in this figure.

*Cl* **202** *SC* **202.3.6** *P* **196** *L* **7** # 80

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

TA_Quiet doesn't show up anywhere else it needs definition. How does this differ from TS_Quiet or QUIET? Is this the 9040 ns LEADER TDD_qt_timer? Or is it the 773.33 ns FOLLOWER value? If it differs, specify that.

*SuggestedRemedy*

Please replace with QUIET or appropriate term in Figures 202-17 and 202-18 and define its duration.

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

ACCEPT IN PRINCIPLE.

Replace with QUIET (N_z) when tx_mode = SEND_TA or tx_mode = SEND_N.

Grant Editor's license to add the N_z values to Table 202-5, Table 202-6, and Table 202-7.

*Cl* **202** *SC* **202.3.7.1** *P* **197** *L* **34** # 81

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

202.3.7.1 is unnecessary, since this has been previously stated for the entire clause (in 202.1.7)

*SuggestedRemedy*

Delete 202.3.7.1

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

ACCEPT.

*Cl* **202** *SC* **202.3.7.2.2** *P* **198** *L* **24** # 169

Chini, Ahmad — Broadcom

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

training_mode is used but not specified as a variable

*SuggestedRemedy*

Add training_mode to the list of variables

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

REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **202** *SC* **202.3.7.2.2** *P* **199** *L* **1** # 170

Chini, Ahmad Broadcom

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

rx_data_active specifies but not used

*SuggestedRemedy*

remove rx_data_active

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

ACCEPT.

*Cl* **202** *SC* **202.3.7.2.2** *P* **199** *L* **12** # 168

Chini, Ahmad Broadcom

*Comment Type* **E** *Comment Status* **D** *PCS*

tdd_detect is not used.

*SuggestedRemedy*

remove tdd_detect

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

PROPOSED ACCEPT IN PRINCIPLE.

Accommodated by Comment #82.

*Cl* **202** *SC* **202.3.7.2.2** *P* **199** *L* **18** # 82

Zimmerman, George CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

The variables tx_data_active, tx_qt_active, and tdd_detect are unused in the state diagrams. All the timers are unused in the state diagrams.

*SuggestedRemedy*

delete definitions for tdd_detect, tx_data_active, and tx_qt_active.
Delete 202.3.7.2.3 and all timers

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

ACCEPT.

*Cl* **202** *SC* **202.3.7.2.2** *P* **199** *L* **19** # 171

Chini, Ahmad Broadcom

*Comment Type* **E** *Comment Status* **D** *PCS*

tx_data_active specified but not used

*SuggestedRemedy*

remove tx_data_active

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

PROPOSED ACCEPT IN PRINCIPLE.

Accommodated by Comment #82.

*Cl* **202** *SC* **202.3.7.2.2** *P* **199** *L* **29** # 172

Chini, Ahmad Broadcom

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

tx_qt_active specified but not used

*SuggestedRemedy*

remove tx_qt_active

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

ACCEPT IN PRINCIPLE.

Accommodated by Comment #82.

*Cl* **202** *SC* **202.3.8.2** *P* **205** *L* **26** # 83

Zimmerman, George CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

The bits of the MultiGBASE-T1 PCS registers which reference clause 149 and are used by clauses 201 and 202 need to have the references added.

*SuggestedRemedy*

Add 45.2.3.87.1, 45.2.3.87.2, 45.2.3.87.3, 47.2.3.87.6
Add references to 201.4.7.1 and 202.3.7.2.2 where it says "defined in 149.8.1.", for definitions of pcs_status, block_lock, and hi_rfer. to 45.2.3.87.1, .2, and .3.
Add reference to 201.3.7.2, 201.4.7.2, and 202.3.8.2 where it says "as defined by RFER_count in 149.3.8.2" to 47.2.3.87.6.
Delete editor's note at 202.3.8.2
Delete TBDs in definitions of pcs_status, block_lock, and hi_rfer in 202.3.8.1 (P205 L10-20)

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

ACCEPT.

*Cl* **202** *SC* **202.4.2** *P* **206** *L* **47** # 132

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

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

Use more common reference structure.

*SuggestedRemedy*

Replace, "The PMA reference diagram, Figure 202-22, shows..."

with "The PMA reference diagram (see Figure 202-22) shows..."

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

ACCEPT.

*Cl* **202** *SC* **202.4.2.2** *P* **207** *L* **21** # 85

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

The TDD cycles are generated by the PCS. The PMA doesn't have a requirement to repeat the cycles - it does what the PCS tells it to.

*SuggestedRemedy*

Delete "The PMA shall repeat such TDD cycles with the predefined timing parameters specified in 202.3.6."

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

ACCEPT.

*Cl* **202** *SC* **202.4.2.3** *P* **207** *L* **42** # 86

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

The PMA Receive function must be able to receive PAM2 in all cases and PAM4 in 10Gb/s mode. Not "PAM2 or PAM4 signals"

*SuggestedRemedy*

Change "for PAM2 or PAM4 signals on the balanced pair or the single ended coaxial cable." to "for PAM2 signals and for PAM4 signals when receiving 10 Gb/s on the balanced pair or the single ended coaxial cable."

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

ACCEPT IN PRINCIPLE.

(Editor' note: Include wording for all rates, not just 10 Gb/s.)

Change "for PAM2 or PAM4 signals on the balanced pair or the single ended coaxial cable."

to "for PAM2 signals for all rates and for PAM4 signals when receiving 10 Gb/s on the balanced pair or single ended coaxial cable."

*Cl* **202** *SC* **202.4.2.3** *P* **208** *L* **1** # 84

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

The description of loc_rcvr_status is unclear and may be contradictory. First it says it is "expected to" become NOT_OK when the link_partner's tx_mode changes to SEND_Z from any other value, then it says that the failing to receive the "consecutive TDD bursts" could trigger deassertion (which should say "NOT_OK"), then it REQUIRES that SEND_Z during the QUIET period NOT trigger de-assertion. I looked at Figure 202-26, but only see SEND_Z transmitted during training. During data mode tx_mode is SEND_N....

*SuggestedRemedy*

Suggest: Change "The SEND_Z signal during the TDD QUIET period alone shall not trigger the DUT to de-assert its loc_rcvr_status." to "The reception of Z symbols during the TDD QUIET period alone, if followed by a TDD burst shall not trigger setting loc_rcvr_status to NOT_OK."

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

ACCEPT IN PRINCIPLE.

Accomodated by Comment #257.

*Cl* **202** *SC* **202.4.2.3** *P* **208** *L* **3** # 257

Wang, Frank — Realtek Semiconductor Corp.

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

To align with clause 201, using the definition of "Z".

*SuggestedRemedy*

change:
"The SEND_Z signal during the TDD QUIET period alone shall not trigger the DUT to de-assert its loc_rcvr_status."
to:
"The received Z symbols during the TDD QUIET period alone shall not trigger setting loc_rcvr_status to become NOT_OK."

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

ACCEPT IN PRINCIPLE.

change:
"The SEND_Z signal during the TDD QUIET period alone shall not trigger the DUT to de-assert its loc_rcvr_status."

to:
The reception of Z symbols during the TDD QUIET period alone shall not trigger setting loc_rcvr_status to NOT_OK."

*Cl* **202** *SC* **202.4.2.4.2** *P* **209** *L* **20** # 87

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

Octet 3<T:0> appears to be a typo - should be <7:0>

*SuggestedRemedy*

See comment.

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

ACCEPT.

*Cl* **202** *SC* **202.4.2.4.5** *P* **210** *L* **24** # 148

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

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

Missing "." at the end of the sentence.

*SuggestedRemedy*

Replace "misconfiguration"

with "misconfiguration."

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

ACCEPT.

*Cl* **202** *SC* **202.4.2.4.5** *P* **210** *L* **26** # 136

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

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

Use more typical reference language and more the reference closer to the descriptive text.

*SuggestedRemedy*

Replace "... contains the PHY capability bits."

with "... contains the PHY capability bits as shown in Table 202-10."

Delete, "See Table 202-10 for the details." on P210, L27.

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

ACCEPT.

*Cl* **202** *SC* **202.4.2.4.5** *P* **211** *L* **1** # 88

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

I thought the precoder was deleted.

*SuggestedRemedy*

Delete sentence at P211 L1-2: " PrecodeSel indicates. 202.3.2.2.19)."
Replace PrecodeSel with Reserved in Table 202-10
At P211 L47, change "the negotiated speed, and the PrecodeSel" to ", and the negotiated speed"
Delete "PrecoderSel," at P213 L35 (202.4.2.4.11)

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

ACCEPT IN PRINCIPLE.

Delete sentence at P211 L1-2: " PrecodeSel indicates. 202.3.2.2.19)."

Replace PrecodeSel with Reserved in Table 202-10

At P211 L47, change ", the negotiated speed, and the PrecodeSel" to "and the negotiated speed"

Delete "PrecoderSel," at P213 L35 (202.4.2.4.11)

Grant Editorial license to remove precoder in any other locations not addressed.

*Cl* **202** *SC* **202.4.2.4.6** *P* **211** *L* **12** # 137

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

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

Use more typical reference language.

*SuggestedRemedy*

Replace "...Oct8<7> = delay_count_valid. See Table 202-11 for the details."

with "...Oct8<7> = delay_count_valid as shown in Table 202-11."

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

ACCEPT.

*Cl* **202** *SC* **202.4.2.4.11** *P* **213** *L* **29** # 90

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

"When entering the TRAINING0 state" - does this mean that the alignment is already there upon entry? If so, "Prior to entering" would make sense. If not (which I think is the meaning), then when does aligment need to take place by? If it is the latter, separation of TRAINING0 into an alignment state and a state maintaining the alignment is recommended, with the requirements language removed.

*SuggestedRemedy*

Either : Change "When entering. on the transmit MDI" to "Upon entry to the TRAINING0 state, the first symbol to of the FOLLOWER's transmit PMA training frame at the transmit MDI shall be aligned so that it is "
OR: Consider when the alignment must occur by, and separate the TRAINING0 state into multiple states - one where alignment occurs and one where the alignment is maintained. This also necessitates removal of the 2 "shalls" on P213 L29 and L32.

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

ACCEPT IN PRINCIPLE.

Change "When entering the TRAINING0 state, the FOLLOWER shall align the first symbol of the transmit PMA training frame to be on the transmit MDI..."

to "Upon entry to the TRAINING0 state, the first symbol to of the FOLLOWER's transmit PMA training frame at the transmit MDI shall be aligned so that it is..."

On P213, L31:
Change "The FOLLOWER shall maintain this alignment while in the TRAINING0 state."
To: The FOLLOWER shall maintain this alignment while in the TRAINING0 and COUNTDOWN0 states (i.e., while tx_mode = SEND_TS)."

*Cl* **202** *SC* **202.4.2.4.11** *P* **213** *L* **30** # 89

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

The timing requirement for the FOLLOWER's transmit frame is infinitely precise - no tolerance. Suggest some tolerance is appropriate (either +/- or express as a matter of baud intervals). The situation also applies to the

*SuggestedRemedy*

Suggest +/- 1/2 baud interval. (TFTD - this is probably wrong)

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

ACCEPT IN PRINCIPLE.

Replace, "...the transmit MDI 133.33 ns after."

with, "...the transmit MDI 400 transmit symbols +/- 1 symbol after."

*Cl* **202** *SC* **202.4.2.4.11** *P* **213** *L* **33** # 91

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

Suggest that the requirment for the FOLLOWER Infofield burst coutn to match the LEADER's from the preceding frame isn't what you want - it can be met by simply echoing the count. I think this isn't a 'shall' but rather a recommendation that the counts should equal each other. Also, the name of the field is PHY burst count, not Infofield burst count.

*SuggestedRemedy*

Change "shall match" to "should match" at P213 L33
Change "FOLLOWER Infofield burst count" to "PHY burst count communicated by the FOLLOWER"
Change "LEADER Infofield burst count from" to "PHY burst count communicated by the leader during"

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

ACCEPT.

*Cl* **202** *SC* **202.4.2.4.11** *P* **213** *L* **36** # 92

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

I think you mean exchanged "using" infofields (you're not swapping these for infofields)

*SuggestedRemedy*

see comment.

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

ACCEPT IN PRINCIPLE.

Replace, "are exchanged with Infofields"

with, "are exchanged using Infofields"

*Cl* **202** *SC* **202.4.2.4.11** *P* **213** *L* **36** # 94

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

*Comment Type* **T** *Comment Status* **D** *PMA*

the exit from TRAINING0 is "negotiation_done" which means the speed must be negotiated before exit. Therefore, "will be" should be "is", as it isn't a future action, it happens in the TRAINING0 state, which is what the paragraph is about. This might be clearer with some discussion of moving on after the negotiation as well.

*SuggestedRemedy*

change "will be" to "is"
Suggest that a final sentence, something like "Upon successful completion of the negotiation, training moves on to the COUNTDOWN."

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

PROPOSED ACCEPT IN PRINCIPLE.

(Editor's note: The state is COUNTDOWN0, and this is already stated in the final paragraph of this section. So, perhaps moving the final paragraph up to this location is helpful?)

change "will be" to "is" on P213, L36

Move, "The LEADER and FOLLOWER will move from TRAINING0 state to COUNTDOWN0 state, if local_rcvr_status and rem_rcvr_status are both asserted, and negotiation_done bit is OK." from P213, L52 to the end of the paragraph on P213, L38.

*Cl* **202** *SC* **202.4.2.4.11** *P* **213** *L* **38** # 93

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

The paragraph is already talking about being IN the TRAINING0 state, but this last sentence talks about 'until it enters the TRAINING0 state', and refers to 'this alignment' which doesn't have a precedent (what is "this alignment" here?) seems to be out of place, possibly left over and referrng to the requirement on line 32.

*SuggestedRemedy*

Delete "The FOLLOWER shall continue to maintain this alignment until it enters the TRAINING0 state."

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

ACCEPT.

*Cl* **202** *SC* **202.4.2.4.11** *P* **213** *L* **43** # 178

Chini, Ahmad — Broadcom

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

The delay requirement is for both training and normal mode, but normal mode is not mentioned anywhere else.

*SuggestedRemedy*

Include normal mode as in below

When entering the TRAINING1 state or normal mode, the FOLLOWER shall use the LEADER transmitted delay_count to align its transmit PMA frame to be 176 ns - delay_count × 5.33 ns (+-5.3ns), after the last PMA training or normal mode payload symbol from the LEADER appears on the FOLLOWER input MDI.

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

PROPOSED ACCEPT IN PRINCIPLE.

Consider with Comment #95.

Change, P213, L43-46 to:

When entering the TRAINING1 state, the FOLLOWER shall use the LEADER transmitted delay_count to align its transmit PMA frame to 176 ns - delay_count × 5.333 ns (+/-5.333 ns) after the last PMA training or normal mode payload symbol from the LEADER appears on the FOLLOWER input MDI."

Add new sentence to the end of the paragraph on P213, L46, "The FOLLOWER shall maintain this alignment while tx_mode is SEND_TA or SEND_N."

*Cl* **202** *SC* **202.4.2.4.11** *P* **213** *L* **44** # 95

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

shall align its transmit PMA training frame. again, precise timing (see earlier comment about alignment in TRAINING0). It looks like the accuracy here should be related to the granular resolution of delay_count, which is 5.333 ns per tha above. There is a mismatch in the precision of the 5.33ns here and the 5.333 stated in the definition of delay_count...

*SuggestedRemedy*

Change "5.33 ns" to insert, "5.333 ns, +/- 0.5 delay count units," at P213 L44

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

ACCEPT IN PRINCIPLE.

Accommodated by Comment #178.

*Cl* **202** *SC* **202.4.2.4.11** *P* **213** *L* **47** # 96

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

*Comment Type* **T** *Comment Status* **D** *PMA*

The link_fail_inhibit timer is started within the TRAINING0 state. This may never happen. The conventions of 21.5 are adopted. These say that the actions in the state are executed instantaneously - and then the state waits for the exit conditions. Therefore, when training0 is entered, it checks once, and only once for training_active and detect_lp_burst, and starts the link fail inhibit timer, setting training_active to 1. training_active should be 0 on the first pass through. so it becomes a matter of whether detect_lp_burst is true on entry - For the FOLLOWER, since loc_rcvr_status needs to be OK, this is probably fine, but the text is still not right since teh follower could get more than one burst before loc_rcvr_status = OK. For the LEADER, this is a problem, because it goes straight to TRAINING0 and detect_lp_burst will be FALSE (because the follower is SILENT, and the leader doesn't start transmitting until it enters TRAINING0). The statement to start the link_fail_inhibit timer never happens (and training_active never gets set to 1). When the follower transitions, negotiation may complete, you come out of TRAINING0 without the link_fail_inhibit timer started and without the LEADER's training_active being set to 1.

NOTE - the suggestion fixes the link_fail_inhibit_timer & training_active problem, and aligns the descriptive text, but might not be the desired behavior - this may require more work on the state diagram to get the desired behavior....

*SuggestedRemedy*

Suggest TRAINING0 be changed in Figure 202-26 to delete "IF (training_active = 0 * detect_lp_burst) THEN" and "END" (and adjust indent on currently nested statements) Delete first two sentences of the 5th paragraph (The LEADER link_fail_inhibit_timer. training frame to the LEADER.)

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

PROPOSED ACCEPT IN PRINCIPLE.

TFTD. Consider with Comment #238.

*Cl* **202** *SC* **202.4.2.4.11** *P* **213** *L* **54** # 97

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

*Comment Type* **E** *Comment Status* **D** *PMA*

The description of the startup sequence seems to stop halfway through. It's odd and not helpful. It would be nice to complete.

*SuggestedRemedy*

Suggest, adding new text after last paragraph of 202.4.2.4.11:
"The COUNTDOWN0 state synchronizes the link partners' transition from symmetric training TDD bursts (SEND_TS) to asymmetric training TDD bursts (SEND_TA) in the TRAINING1 state. The TRAINING1 state then waits until both local and remote receivers settle and signal that their status is OK, before transitioning to a subsequent countdown, COUNTDOWN1. Following the completion of COUNTDOWN1, the PCS is tested, and, if the link is reliable, as indicated by block lock and the RS-FEC error rate, PHY Control transitions to PCS_DATA and begins transferring data."

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

PROPOSED ACCEPT.

(Editor's note: Other comments have already addressed some of the TRAINING0->COUNTDOWN0->TRAINING1, but laying it all out sequentially is useful and can be adjusted further if needed.)

Add new text after last paragraph of 202.4.2.4.11:
"The COUNTDOWN0 state synchronizes the link partners' transition from symmetric training TDD bursts (SEND_TS) to asymmetric training TDD bursts (SEND_TA) in the TRAINING1 state. The TRAINING1 state then waits until both local and remote receivers settle and signal that their status is OK, before transitioning to a subsequent countdown, COUNTDOWN1. Following the completion of COUNTDOWN1, the PCS is tested, and, if the link is reliable as indicated by block lock and the RS-FEC error rate, PHY Control transitions to PCS_DATA and begins transferring data."

*Cl* **202** *SC* **202.4.3.1** *P* **214** *L* **28** # 112

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

There is no mention of what signals are transmitted during 2.5Gb/s or 5 Gb/s transmission. "all other symbols" isn't really sufficient specification.

*SuggestedRemedy*

Insert the following new second sentence in the first paragraph of 202.4.3.1:
"For 100 Mb/s, 2.5 Gb/s or 5 Gb/s, all transmit symbols are PAM2."

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

PROPOSED ACCEPT IN PRINCIPLE.

Replace, "During RS-FEC frame transmission, 10 Gb/s transmit path uses PAM4 while all other symbols transmitted within a burst use PAM2."

with, "For 100 Mb/s, 2.5 Gb/s, or 5 Gb/s transmit rates, the refresh header and burst payload symbols are PAM2. For 10 Gb/s transmit rates, the burst payload is transmitted using PAM4 symbols, while the refresh header is transmitted using PAM4 symbols. When QUIET (i.e., not transmitting PAM2 or PAM4 symbols), Z symbols are transmitted."

Likely resolution is to refer to 202.5.2.4 contingent on EZ resolution of comment #260 which also defines Tx MDI behavior when tx_symb=Z, or use similar wording in both places.

*Cl* **202** *SC* **202.4.4.1** *P* **215** *L* **6** # 100

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

Definition of config should just reference the parameter passed by the primitive. There is no reason to reference passing to the PCS here either.

*SuggestedRemedy*

Change definition of config to : "See 202.2.1.2."

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

ACCEPT.

*Cl* **202** *SC* **202.4.4.1** *P* **215** *L* **11** # 101

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

A better description is needed for link_control than just how it is set. Also descriptions are needed for the values. Consider using a different name too - link_control is used for the variable going to the TDI throughout 802.3, and this one doesn't do that - it is more like sync_link_control iin the automotive clauses.

*SuggestedRemedy*

Suggest change name of link_control to link_enable
Change Description to : "This link_enable variable is set by management or default to enable or disable the PHY. It is set to disable the link upon power on reset or release from power down (See 202.4.2.5). Transition to ENABLE initiates PHY Control and the Link Monitor state diagrams. Values:
DISABLE Disable the transmitter and await initiation of training.
ENABLE Enable operation of the PHY.

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

ACCEPT IN PRINCIPLE.

Change name of link_control to link_enable

Change Description to : "This variable is set by management or default to enable or disable the PHY. It is set to disable the link upon power on reset or release from power down (see 202.4.2.5). Transition to ENABLE initiates PHY Control and the Link Monitor state diagram. Values:
DISABLE Disable the transmitter and await initiation of training.
ENABLE Enable operation of the PHY.

Grant Editor's license to make this change throughout the document where appropriate.

*Cl* **202** *SC* **202.4.4.1** *P* **215** *L* **16** # 102

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

The values of link_status need definition.

*SuggestedRemedy*

Change "Values: OK or FAIL" to "Values:
FAIL No valid link established.
OK The Link Monitor function indicates that a valid MultiGBASE-A link is established. Reliable reception of signals transmitted from the remote PHY is possible."

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

ACCEPT.

*Cl* **202** *SC* **202.4.4.1** *P* **215** *L* **18** # 99

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

You shouldn't put the state diagram actions in the variable definitions. Put the reset of loc_countdown_done in the state diagram. However, it isn't clear this is the right variable. The text says (202.3.2.4.7) "The LEADER will exit a COUNTDOWN state after sending the last burst (BC24=PhaseSwBC24-1), and receiving the last burst from the FOLLOWER. The FOLLOWER will exit a COUNTDOWN state after receiving the last burst (BC24=PhaseSwBC24-1) from the LEADER and finishing sending the last burst of its own."

The same can be said of rem_countdown_done at P216 L1

*SuggestedRemedy*

Change definition of loc_countdown_done to:
This variable is only used by the LEADER. It indicates that the LEADER has finished sending the last LEADER countdown
Infofield and received the responding (last) Infofield from the FOLLOWER at the current TRAINING stage.
Values:
TRUE: The LEADER has sent it's last burst (BC24=PhaseSwBC24-1), and received the last burst from the FOLLOWER as indicated by the received InfoField since the latest entry to a TRAINING state.
FALSE: The LEADER has not sent it's last burst (BC24=PhaseSwBC24-1), or has not received the last burst from the FOLLOWER as indicated by the received InfoField since the latest entry to a TRAINING state.

Change definition of rem_countdown_done to:
This variable is only used by the FOLLOWER. It indicates that the FOLLOWER has finished receiving the last Infofield from the LEADER at the current TRAINING stage, and has sent at least one Infofield.
Values:
TRUE: The FOLLOWER has received the last burst (BC24=PhaseSwBC24-1) sent by the leader, and has sent at least one InfoField since the latest entry to a TRAINING state.
FALSE: The FOLLOWER has not received the last burst (BC24=PhaseSwBC24-1) sent by the leader, or has not sent at least one InfoField since the latest entry to a TRAINING state.

Insert "loc_countdown_done <= FALSE" in states TRAINING0 and TRAINING1.

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

ACCEPT IN PRINCIPLE.

Change definition of loc_countdown_done to:
This variable is only used by the LEADER. It indicates that the LEADER has finished sending the last LEADER countdown Infofield and received the responding (last) Infofield from the FOLLOWER at the current TRAINING stage.
Values:
TRUE: The LEADER has sent its last burst (BC24=PhaseSwBC24-1) and received the last burst from the FOLLOWER, as indicated by the received InfoField since the latest entry to a

TRAINING state.
FALSE: The LEADER has not sent its last burst (BC24=PhaseSwBC24-1) or has not received the last burst from the FOLLOWER, as indicated by the received InfoField since the latest entry to a TRAINING state.

Change definition of rem_countdown_done to:
This variable is only used by the FOLLOWER. It indicates that the FOLLOWER has finished receiving the last Infofield from the LEADER at the current TRAINING stage, and has sent at least one Infofield.
Values:
TRUE: The FOLLOWER has received the last burst (BC24=PhaseSwBC24-1) sent by the leader and has sent at least one InfoField since the latest entry to a TRAINING state.
FALSE: The FOLLOWER has not received the last burst (BC24=PhaseSwBC24-1) sent by the leader or has not sent at least one InfoField since the latest entry to a TRAINING state.

Insert "loc_countdown_done <= FALSE" in states TRAINING0 and TRAINING1.

---

*Cl* **202** *SC* **202.4.4.1** *P* **215** *L* **26** # 103

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

what is "correct" or "incorrect" operation?. The remaining description is already covered. I believe what is meant is similar to other phys where the operation is implementation dependent, which is defined in 202.4.2.3. Fortunately, the variable is already defined in 202.2.1.7.

*SuggestedRemedy*

Change description of loc_rcvr_status to read:
See 202.2.1.7.

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

ACCEPT.

---

*Cl* **202** *SC* **202.4.4.1** *P* **215** *L* **34** # 258

Wang, Frank — Realtek Semiconductor Corp.

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

wording

*SuggestedRemedy*

change "loc_rcvr_status=1" to "loc_rcvr_status = OK"

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

ACCEPT.

---

*Cl* **202** *SC* **202.4.4.1** *P* **215** *L* **34** # 104

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

Duplicate shall. There is already a requirement to exchange capabilities.

*SuggestedRemedy*

delete "shall" (the LEADER and FOLLOWER exchange capabilities.)

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

ACCEPT.

---

*Cl* **202** *SC* **202.4.4.1** *P* **215** *L* **40** # 105

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

There are no values given for pcs_data_mode. It appears to be a Boolean (TRUE/FALSE).

*SuggestedRemedy*

Change description to begin, "A Boolean variable generated by."

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

ACCEPT IN PRINCIPLE.

In 202.2.1.9.1
Add on P169L20
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.

P215 L41 Change the definintion of pcs_data_mode to: See 202.2.1.9.1.

---

*Cl* **202** *SC* **202.4.4.1** *P* **215** *L* **50** # 261

Wang, Frank — Realtek Semiconductor Corp.

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

remove the text highlight

*SuggestedRemedy*

remove the the text highlight for "7:6"

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

ACCEPT.

*Cl* **202** *SC* **202.4.4.1** *P* **216** *L* **9** # 106

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

what is "correct" or "incorrect" operation?. The remaining description is already covered. Like loc_rcvr_status, the variable is already defined in the primitives section, see 202.2.1.8.

*SuggestedRemedy*

The status of the link partner's receiver indicated in the loc_rcvr_status received in the InfoField from the remote PHY. See 202.2.1.8.1.

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

ACCEPT IN PRINCIPLE.

Replace the definition of rem_rcvr_status with, "The status of the link partner's receiver indicated in the loc_rcvr_status received in the InfoField from the remote PHY. See 202.2.1.8.1."

*Cl* **202** *SC* **202.4.4.1** *P* **216** *L* **16** # 107

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

*Comment Type* **T** *Comment Status* **D** *PMA*

tdd_watchdog_status is not set anywhere. There is no defined function as a TDD monitor. This variable appears to be used only in the link monitor, and it might be eliminated if the link monitor were expanded to include the referenced TDD monitor (or might be deleted altogether) This functionality appears to involve a timeout counter of 96 usec, and some criterion for detection of reliable operation of TDD bursts...

*SuggestedRemedy*

Either: Delete tdd_watchdog_status and the definition (P216 L16-24, and it's use on exit from LINK_UP in Figure 202-28 (Link Monitor SD))
OR: provide the referenced TDD monitor functionality, preferably by augmenting the link monitor state diagram.

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

PROPOSED ACCEPT IN PRINCIPLE.

TFTD. Consider with Comment #237.

(Editor's note: The intent was for TDD_watchdog_status to be similar to the PMA_watchdog_status in 97.4.4.1. To add to the state machine would be possible by defining a 96usec timer that is started on entry to LINK_UP and when done causes transition to LINK_DOWN. The LINK_UP state would transition to LINK_UP upon detect_lp_burst to restart the timer. The tdd_watchdog_status could be deleted in favor of a tdd_watchdog_timer.)

*Cl* **202** *SC* **202.4.4.1** *P* **216** *L* **18** # 237

Lee, Ching-Yen — Realtek Semiconductor Corp.

*Comment Type* **T** *Comment Status* **D** *PMA*

The describtion of tdd_watchdog_status needs to be modified.

*SuggestedRemedy*

change "Variable indicating the status of the TDD monitor." to "Variable indicating whether a reliable TDD burst is detected."

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

PROPOSED ACCEPT IN PRINCIPLE.

TFTD. Consider with Comment #107.

(Editor's note: Perhaps this can be addressed by having a tdd_watchdog_timer?)

*Cl* **202** *SC* **202.4.4.1** *P* **216** *L* **25** # 108

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

tx_mode is defined identically in 202.2.1.1. It isn't a good idea to duplicate text, as they may get out of sync.

*SuggestedRemedy*

Replace definition of tx_mode with "See 202.2.1.1"

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

ACCEPT.

*Cl* **202** *SC* **202.4.4.1** *P* **216** *L* **35** # 259

Wang, Frank — Realtek Semiconductor Corp.

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

To align with clause 201, using the definition of "Z".

*SuggestedRemedy*

change "zero symbols" to "Z symbols"

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

ACCEPT.

*Cl* **202** *SC* **202.4.4.2** *P* **216** *L* **40** # 109

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

the link_fail_inhibit timer is started when the state diagram says it is. The variable text contradicts the diagram. But as noted earlier there is a problem with the diagram. If fixed as described in the comment, the timer starts when PHY control enters TRAINING0. For the LEADER this is when the first symmetric burst starts to be generated by the PCS, for the follower, this is when the loc_rcvr_status is OK AND minwait_timer is done.

*SuggestedRemedy*

Delete P216 L45-48 ("LEADER: This timer.. to the LEADER.")

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

ACCEPT IN PRINCIPLE.

(Editor's note: The corrected state machine comments will allow this to be deleted.)

Delete P216 L45-48 ("LEADER: This timer.. to the LEADER.")

*Cl* **202** *SC* **202.4.5** *P* **217** *L* **3** # 238

Lee, Ching-Yen — Realtek Semiconductor Corp.

*Comment Type* **T** *Comment Status* **D** *PMA*

The PHY Control state diagram needs to be updated.

*SuggestedRemedy*

An updated figure will be provided.
Add the following two variable to 202.4.4.1:
detect_lp_burst
A Boolean variable that is set TRUE when the TDD burst has been detected. Set to FALSE when the PMA detected the burst has ended (PMA could use timer timeout to terminate this detection signal).

training_active
A Boolean variable that is set TRUE when the link_fail_inhibit_timer is started. Set to FALSE after entering the DISABLE_TRANSMITTER state and PCS_DATA state.

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

PROPOSED ACCEPT IN PRINCIPLE.

TFTD. Consider with Comment #96

(Editor's note: Looping can be just on !training_active, we don't need to loop every time detect_lp_burst=FALSE. Try to avoid state machine stuff in the variables, and clarify the detect_lp_burst excludes Z.)

Implement changes in
https://www.ieee802.org/3/dm/public/040726/Lee_3dm_01_070426.pdf

Add the following two variables to 202.4.4.1:

detect_lp_burst
A Boolean variable indicating whether PAM2 or PAM4 symbols of a TDD burst have been detected.
Values:
TRUE: TDD PAM2 or PAM4 symbols are detected.
FALSE: PMA detects the Z symbols after the PAM2/PAM4 burst has ended (PMA could use timer timeout to terminate this detection signal).

training_active
A Boolean variable indicating whether the link_fail_inhibit_timer has started.
Values:
TRUE: The link_fail_inhibit_timer is running and the link is in a training phase.
FALSE: The link is not currently in a training phase.

Change training_active <= 0 in DISABLE_TRANSMITTER and PCS_DATA to training_active <= FALSE

Change training_active <= 1 in TRAINING0 to training_active <= TRUE

---

*Cl* **202** *SC* **202.4.5** *P* **217** *L* **16** # 110

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

training_active is not defined. This appears to be boolean. It appears to be an indication that this is the first pass through TRAINING0 and has not made it to PCS_DATA

*SuggestedRemedy*

Add definition for training_active to 202.4.4.1
training_active
A Boolean variable indicating that PHY Control has passed through the TRAINING0 state at least once since the exiting DISABLE_TRANSMITTER and has not yet reached PCS_DATA.

Change training_active <= 0 in DISABLE_TRANSMITTER and PCS_DATA to training_active <= FALSE
Change training_active <= 1 in TRAINING0 to training_active <= TRUE

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

ACCEPT IN PRINCIPLE.

Accommodated by Comment #238.

---

*Cl* **202** *SC* **202.4.5** *P* **217** *L* **22** # 111

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

training_phase is not defined. This appears to be the varialbe communicated in the infofield.

*SuggestedRemedy*

Add definition for training_phase to 202.4.4.1
This variable indicates whether training is currently in the symmetric mode or the assymetric mode of training. It is transmitted to the link partner in the InfoField. See 202.4.2.4.4.
Values:
00 PHY Control is currently in either in a silent mode or a symmetric training phase.
01 PHY Control is currently in asymmetric training.

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

ACCEPT.

---

*Cl* **202** *SC* **202.4.5** *P* **217** *L* **34** # 187

Muma, Scott — Microchip

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

Due to the way the state machine conventions work it's possible the link_fail_inhibit_timer never starts. Add a re-entry to TRAINING0 when detect_lp_burst=TRUE to ensure the timer will be started before transitioning to COUNTDOWN0.

*SuggestedRemedy*

See attached PDF P8023dm_D0pc_bit_order_figure_markup.pdf Figure 202-26 part a

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

ACCEPT IN PRINCIPLE.

Insert changes in file P8023dm_D0pc_bit_order_figure_markup.pdf Figure 202-26 part a

Grant Editorial license to align with Comment #238 and implement in alignment with Style.

---

*Cl* **202** *SC* **202.4.5** *P* **218** *L* **17** # 98

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

*Comment Type* **T** *Comment Status* **D** *PMA*

TRAINING1 may simply fall through since loc_rcvr_status and rem_rcvr_status will likely be true on entry. Resetting them to NOT_OK in the state will prevent this, and they will get executed once on entry, and become OK as the local receiver settles and the remote receiver sends OK status via infofield.

*SuggestedRemedy*

add "loc_rcvr_status <= NOT_OK" and "rem_rcvr_status <= NOT_OK" to state TRAINING1.

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

PROPOSED ACCEPT IN PRINCIPLE.

Consider with Comment #238.

---

*Cl* **202** *SC* **202.5.1** *P* **220** *L* **11** # 113

Zimmerman, George — CME Consulting/ADI,APL Gp, Cisco, Infineon, OnSe

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

If the precoder is eliminated, then test mode 3 is eliminated too.

*SuggestedRemedy*

change the description of register value 3 to Test mode 3 - Reserved
Delete paragraph at P220 L20 through P220 L25 (Test mode 3)

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

ACCEPT.

Cl **202** SC **202.5.1** P **220** L **24** # 177

Chini, Ahmad — Broadcom

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

Precoder is for 10Gbps link only

*SuggestedRemedy*

Add a sentence to indictae test mode 3 is not required if 10Gbps is not supported.

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

REJECT.

Precoder has been removed.

Cl **202** SC **202.5.2.4** P **224** L **30** # 260

Wang, Frank — Realtek Semiconductor Corp.

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

To align with clause 201, using the definition of "Z".

*SuggestedRemedy*

add a new sentence: "When tx_symb is "Z", the transmit signal at the MDI is nominally zero, and the transmit signal shall be less than -36dBm."

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

ACCEPT IN PRINCIPLE.

Insert a new sentence: "When the value of tx_symb is Z, the transmit signal at the MDI is nominally zero and the transmit signal shall be less than -36 dBm."

Grant Editorial license to align 202.4.2.2.1 with change.

Cl **202** SC **202.5.2.4** P **226** L **22** # 262

Wang, Frank — Realtek Semiconductor Corp.

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

wording

*SuggestedRemedy*

remove "(TBD)"

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

ACCEPT.

Cl **202** SC **202.5.2.6** P **227** L **28** # 179

Chini, Ahmad — Broadcom

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

PPM is relative itself, no need to scale it by S

*SuggestedRemedy*

Delete
scaled by S

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

ACCEPT IN PRINCIPLE.

Replace, "When the FOLLOWER is using a recovered timing reference, the symbol transmission rate shall be within ± 10ppm of the recovered clock scaled by S."

with, "When the FOLLOWER is using a recovered timing reference, the symbol transmission rate (scaled by S) shall be within ± 10ppm of the recovered clock."

Cl **202** SC **202.5.3.1** P **227** L **47** # 180

Chini, Ahmad — Broadcom

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

Sending decoding data to XGMII is regardless of link reset

*SuggestedRemedy*

Remove

after link reset completion

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

ACCEPT IN PRINCIPLE.

(Editor's note: Reliable data to the XGMII isn't there until link_status=OK or pcs_data_mode=TRUE.)

Replace, "after link reset completion"

with, "after link_status = OK"

Cl **202** SC **202.5.3.2** P **228** L **6** # 133

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

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

Improve clarity and improve accuracy of figures.

*SuggestedRemedy*

Replace, "The receive DUT is connected to the noise source through a directional coupler, as shown in Figure 202-35, with a link segment as defined in 202.7 for -T1 and shown in Figure 202-36, with a link segment as defined in 202.8 for -V1"

with "The -T1 receive DUT is connected to the noise source through a directional coupler with a -T1 link segment (see 202.7 ) as shown in Figure 202-35. The -V1 receive DUT is connected to the noise source through a directional coupler with a -V1 link segment (see 202.8 ) as shown in Figure 202-36."

Replace "Link segment" with "-T1 link segment" in Figure 202-35.

Replace "Link segment" with "-V1 link segment" in Figure 202-36.

Replace "directional coupler" with "Directional coupler" in Figure 202-36.

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

ACCEPT.

Cl **202** SC **202.7.1.6** P **231** L **3** # 181

Chini, Ahmad — Broadcom

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

use a text similar to 201.

*SuggestedRemedy*

Replace

The maximum link delay of a -T1 link segment shall be 160 ns.

With

The propagation delay of a -T1 link segment shall not exceed 160 ns for all frequencies between 3 MHz and 4GHz.

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

ACCEPT IN PRINCIPLE.

Replace

The maximum link delay of a -T1 link segment shall be 160 ns.

With

The propagation delay of a -T1 link segment shall not exceed 160 ns for all frequencies between 3 MHz and 4GHz.

Cl **202** SC **202.7.2.1** P **231** L **18** # 143

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

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

Broken Equation reference.

*SuggestedRemedy*

Replace "Equation (202-32)"

with "Equation (202-25)"

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

ACCEPT.

*Cl* **202** *SC* **202.7.2.1** *P* **231** *L* **29** # 144

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

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

Broken Equation reference.

*SuggestedRemedy*

Replace "Equation (202-33)"

with "Equation (202-26)"

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

ACCEPT.

*Cl* **202** *SC* **202.7.2.1** *P* **232** *L* **1** # 134

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

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

Broken figure link reference.

*SuggestedRemedy*

Replace "Figure 202-44" with "Figure 202-39".

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

ACCEPT.

*Cl* **202** *SC* **202.7.2.2** *P* **232** *L* **32** # 145

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

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

Broken Equation reference.

*SuggestedRemedy*

Replace "Equation (202-34)"

with "Equation (202-27)"

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

ACCEPT.

*Cl* **202** *SC* **202.7.2.2** *P* **233** *L* **2** # 146

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

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

Broken Equation reference.

*SuggestedRemedy*

Replace "Equation (202-35)"

with "Equation (202-28)"

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

ACCEPT.

*Cl* **202** *SC* **202.7.2.2** *P* **233** *L* **13** # 135

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

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

Broken figure link reference.

*SuggestedRemedy*

Replace "Figure 202-45" with "Figure 202-40".

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

ACCEPT.

*Cl* **202** *SC* **202.8.1.6** *P* **236** *L* **42** # 182

Chini, Ahmad Broadcom

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

use a text similar to 201.

*SuggestedRemedy*

Replace

The maximum link delay of a -V1 link segment shall be 160 ns.

With

The propagation delay of a -V1 link segment shall not exceed 160 ns for all frequencies between 3 MHz and 4GHz.

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

ACCEPT IN PRINCIPLE.

Replace

The maximum link delay of a -V1 link segment shall be 160 ns.

With

The propagation delay of a -V1 link segment shall not exceed 160 ns for all frequencies between 3 MHz and 4 GHz.

*Cl* **202** *SC* **202.11.2** *P* **243** *L* **4** # 183

Chini, Ahmad Broadcom

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

"in a professional manner" is not a proper specification

*SuggestedRemedy*

Use the following instead
As per application requirement

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

REJECT.

Cabling and equipment should be secured. The Suggested Remedy does not address what happens if an applicable application requirement doesn't exist. This text currently exists in 96.9.2, 97.9.2, 104.8.3, 146.9.2, 147.10.2, and 149.9.2.