

P802.3dm D2.1 Asymmetrical Electrical Automotive Ethernet 1st Working Group recirculation ballot comn

Cl 1 SC 1.1.3.2 P31 L12 # 80

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

Comment Type TR Comment Status A MAC

The explanation of XGMII needs to reflect 7.5 Gb/s. This also exposes weaknesses in the wording. Specifically, that a MAC doesn't have a data rate, but may be configured (per table 4-2) to a specific data rate - these include only 2.5G, 5G, and 10G.

SuggestedRemedy

Change first and second sentences to read: "The XGMII is designed to connect a full-duplex MAC configured for 2.5 Gb/s, 5 Gb/s, or 10 Gb/s operation to a PHY of the same rate, or to an asymmetric PHY that supports 2.5 Gb/s, 5 Gb/s, 7.5 Gb/s, or 10 Gb/s in one direction and 100 Mb/s in the other. While conformance with implementation of this interface is not necessary to ensure communication, it allows maximum flexibility in intermixing PHYs and DTEs at the referenced data rates."

Response Response Status W

ACCEPT IN PRINCIPLE.

Turn the two options into a list.

Replace first and second sentences with:

The XGMII is designed to connect a full-duplex MAC using the parameters for 2.5 Gb/s, 5Gb/s, or 10 Gb/s to at least one of the following:
a) symmetric PHY that supports data rates of 2.5 Gb/s, 5 Gb/s, or 10 Gb/s;
b) asymmetric PHY that supports data rates of 2.5 Gb/s, 5 Gb/s, 7.5 Gb/s, or 10 Gb/s in one direction and 100 Mb/s in the other.
While conformance with implementation of this interface is not necessary to ensure communication, it allows maximum flexibility in intermixing PHYs and DTEs at the referenced data rates.

Editorial license to add strikethrough and underline as appropriate.

Cl 1 SC 1.1.3.2 P31 L13 # 26

Gorshe, Steve Microchip

Comment Type E Comment Status A MAC

7.5 Gb/s should be added to the list of supported PHY rates (two places)

SuggestedRemedy

Add 7.5 Gb/s to the list "...asymmetric PHY that supports ..." and "...intermixing PHYs and DTEs at ..."

Response Response Status C

ACCEPT IN PRINCIPLE.

Accommodated by #80.

Cl 1 SC 1.4.46a P31 L32 # 81

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

Comment Type E Comment Status A EZ

Rewording of definitions is overly verbose and doesn't quite make sense (e.g., a "Physical Layer specification" for a "Physical Layer"?). Suggested improvement applies to 1.4.46a through 1.4.46f, 1.4.95a & b, and 1.4.178 a & b.

SuggestedRemedy

Change "IEEE 802.3 Physical Layer specification for an asymmetric full duplex Ethernet Physical Layer for point-to-point transmission" to "IEEE 802.3 specification for an asymmetric full duplex Ethernet Physical Layer for point-to-point transmission" in 1.4.46a through 1.4.46f, 1.4.95 a&b, and 1.4.178a&b.

Response Response Status C

ACCEPT.

Cl 1 SC 1.4.405f P33 L12 # 82

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

Comment Type ER Comment Status A EZ-R

MultiGBASE-A definition does not align with MultiGBASE-AT1 and MultiGBASE-AV1 on the speeds and presumes a 1000 Mb/s rate in the opposite direction, which is not in the specification.

SuggestedRemedy

Change "less than or equal to 1000 Mb/s" to "100 Mb/s" to align with 104.405g and 104.405h.

Response Response Status C

ACCEPT.

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CI 30 SC 30.3.2.1.2 P34 L15 # 83

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

Comment Type TR Comment Status A EZ-R

Looking at the PHY type change for MultiGBASE-A highlights an error in all the phy type definitions in 30.3.2.1.2.

These are attributes of aPHYtype. The Behavior states "A read-only value that identifies the PHY type. The value of this attribute maps to the value of aMAUType." Therefore, we should have one per PHY type. That means we shouldn't be defining the family here (combining T1/V1) - these are enumerated management objects and need to enumerate each phy type separately. Note that aMAUType (30.5.1.1.2) is done correctly, with separate entries per type and inconsistently with 30.3.2.1.2 and 30.3.2.1.3. The error effects both 30.3.2.1.2 (PhyType) and 30.3.2.1.3 (PhyType list) which are somewhat redundant. Suggested remedy also includes improved wording for the clause 192 PHY, where the multiple PAM types leads to confusion.

SuggestedRemedy

At P34 Lines 16,17, 24,25, 32, and 33: Replace each T1/V1 entry with an entry for T1 and an entry for V1 adding, "for balanced pair media" to T1 and "for coaxial media" to V1.

At P34 Line 39, Replace MultiGBASE-A with Two entries, one for MultiGBASE-AT1 and one for MultiGBASE-AV1, with definitions:

"MultiGBASE-AT1 Clause 192 Asymmetric rate 2.5Gb/s to 10 Gb/s PAM HS_PATH, 100 Mb/s PAM2 LS_PATH for balanced pair media." and

"MultiGBASE-AV1 Clause 192 Asymmetric rate 2.5Gb/s to 10 Gb/s PAM HS_PATH, 100 Mb/s PAM2 LS_PATH for coaxial media."

Make the corresponding same changes in 30.2.1.3 entries, at P34 L49, 50; P35 L5,6; P35 L12,13; and P35 L19.

Response Response Status C

ACCEPT.

CI 30 SC 30.3.2.1.2 P34 L24 # 157

Regev, Alon Keysight

Comment Type E Comment Status A EZ

The 2.5G table row reads "2.5 Gb/s PAM2 transmit, 100 Mb/s DME receive", but the parallel 5G and 10G rows omit the word "transmit": "5 Gb/s PAM2, 100 Mb/s DME receive" and "10 Gb/s PAM4, 100 Mb/s DME receive". Occurs in both the aPhyType and aPhyTypeList tables.

SuggestedRemedy

Insert "transmit" after "PAM2"/"PAM4" in the 5G and 10G rows of both tables.

Response Response Status C

ACCEPT IN PRINCIPLE.

Make this change after the change defined by #83 to ensure the word "transmit" is added correctly, where appropriate.

CI 31B SC 31B P315 L36 # 122

Muma, Scott Microchip

Comment Type E Comment Status A EZ

Typo 10.5 should be 10

SuggestedRemedy

Change 10.5 to 10

Response Response Status C

ACCEPT IN PRINCIPLE.

Acommodated by Comment #36.

P802.3dm D2.1 Asymmetrical Electrical Automotive Ethernet 1st Working Group recirculation ballot comn

CI 31B SC 31B.2 P312 L # 79

Ran, Adeo Cisco Systems

Comment Type TR Comment Status A delay

Subclause 31B.2 (not included currently) defines the semantics of the pause_time parameter in term of pause_quanta, "equal to 512 bit times of the particular implementation".

In a symmetric PHY, the bit time is unambiguous, so both sides have the same interpretation of the paramter.

In an asymmetric PHY, there are different bit times in each direction. It is unclear which bit time is used for interpretation of the pause_time parameter.

The suggested remedy is based on the assumption that the interpretation is based on the PAUSE originator's receive direction (which is the sender's transmit direction).

SuggestedRemedy

Bring in 31B.2 and add a paragraph addressing asymmetric PHYs, specify that the bit time in that case is based on the PAUSE originator's data rate in the receive direction.

Response Response Status W

ACCEPT IN PRINCIPLE.

Editorial's license to bring in 31B.2 and craft an Insert Editing Instruction to add sentence in << X >>.

pause_time

A 2-octet, unsigned integer containing the length of time for which the receiving station is requested to inhibit data frame transmission. The field is transmitted most-significant octet first, and least-significant octet second. The pause_time is measured in units of pause_quanta, equal to 512 bit times of the particular implementation (see 4.4). <<The bit time equals the transmit MAC bit time at the receiving station for the asymmetric PHYs specified in Clause 192.>> The range of possible pause_time is 0 to 65535 pause_quanta.

CI 31B SC 31B.4.3 P315 L18 # 36

Gorshe, Steve Microchip

Comment Type E Comment Status A EZ

The feature descriptions contain editorial errors. It appears from the table structure that MIIga should pertain to 5 Gb/s transmit (to mirror MIIgb for the receive) and MIIgc should pertain to 7.5 Gb/s transmit (to mirror MIIgd for the receive).

SuggestedRemedy

In MIIga, change "2/5 Gb/s" to "5 Gb/s". In MIIgc, change "5 Gb/s" to "7.5 Gb/s". In MIIlb, change "10.5 Gb/s" to "10 Gb/s".

Response Response Status C

ACCEPT.

CI 45 SC 45.2.1 P37 L18 # 294

Wienckowski, Natalie IVN Solutions LLC; Ethernovia, Bosch

Comment Type T Comment Status A late - EZ

We changed the name of register 1.18, but don't show the updated name in Table 45-3

SuggestedRemedy

Bring in the row for register 1.18 and show the name change as shown in 45.2.1.16.

Response Response Status C

ACCEPT.

CI 45 SC 45.2.1 P37 L24 # 295

Wienckowski, Natalie IVN Solutions LLC; Ethernovia, Bosch

Comment Type T Comment Status A late - EZ

We changed the name of register 1.2100, but don't show the updated name in Table 45-3

SuggestedRemedy

Bring in the row for register 1.2100 and show the name change as shown in 45.2.1.214.

Response Response Status C

ACCEPT.

CI 45 SC 45.2.1 P37 L47 # 84

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

Comment Type E Comment Status A EZ - pull

Footnote suggests there is a "MultiG type" - which isn't defined. Suggest we use the full name. This also highlights that technically, the asymmetric PHYs are not in the MultiGBASE-T1 PHY family....(1.4.407 MultiGBASE-T1: PHYs that belong to the set of specific BASE-T1 PHYs at speeds in excess of 1000 Mb/s, including 2.5GBASE-T1, 5GBASE-T1, and 10GBASE-T1. (See IEEE Std 802.3, Clause 149.)

SuggestedRemedy

Change footnote (a) to read "In addition to the MultiGBASE-T1 PHY family, this register applies to the MultiG+100MBASE and 100M+MultiGBASE-T1/V1 PHY families, including both -T1 and -V1 types."

Response Response Status C

ACCEPT IN PRINCIPLE.

Used wording similar to #15 proposal.

Change footnote (a) to read:

This register applies to MultiGBASE-T1, 100M+MultiGBASE (-T1 and -V1), MultiG+100MBASE (-T1 and -V1), MultiGBASE-AT1, and MultiGBASE-AV1 PHYs.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general

COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

SORT ORDER: Clause, Subclause, page, line

CI 45
SC 45.2.1

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Cl 45 **SC 45.2.1** **P37** **L47** # **115**

Muma, Scott Microchip

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

MultiGBASE-A PHYs also use registers 1.2309-1.2317, so add a footnote

SuggestedRemedy

Add footnote "b This register also applies to MultiGBASE-A PHYs." and note for registers 1.2309-1.2317

Response **Response Status C**

ACCEPT IN PRINCIPLE.

Accommodated by #84.

Cl 45 **SC 45.2.1** **P37** **L47** # **85**

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

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

Also, there should be a similar footnote for MultiGBASE-A, calling out that this relates to both T1 and V1 PHY types.

SuggestedRemedy

Insert new footnote (b) reading "This register applies to both -T1 and -V1 PHY types in the MultiGBASE-A family." attach footnote to the 3 MultiGBASE-A registers (1.2318, 2319, and 2320)

Response **Response Status C**

ACCEPT IN PRINCIPLE.

Add new footnote "b" on 1.2318, 2319, and 2320.

Footnote b: This register applies to both MultiGBASE-AT1 and MultiGBASE-AV1 PHYs.

Cl 45 **SC 45.2.1.10** **P39** **L25** # **158**

Regev, Alon Keysight

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

The editing instruction reads "Change the row for 1.11.11 in Table 45-19 as follows", but the table shown and actually being edited is Table 45-14.

SuggestedRemedy

Correct "Table 45-19" to "Table 45-14" in the instruction sentence.

Response **Response Status C**

ACCEPT.

Cl 45 **SC 45.2.1.16.aaab** **P40** **L27** # **57**

Zherebtsov, Aleksei Infineon

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

The editing instruction reads "Insert 45.2.1.16.aaaa and 45.1.16.aaab before 45.2.1.16.aaa". There is no subclause 45.1.16.aaab; the subclause that is inserted and that carries the heading later in the draft is 45.2.1.16.aaab. An editing instruction that names a subclause which does not exist cannot be executed unambiguously by the editor.

SuggestedRemedy

Change "45.1.16.aaab" to "45.2.1.16.aaab".

Response **Response Status C**

ACCEPT.

Cl 45 **SC 45.2.1.60f** **P40** **L45** # **86**

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

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

Improper editing instruction. Saying 45.2.1.60f.x makes it look like the inserted number is .x. Since the major subclause is inserted (45.2.1.60f), the hierarchy below it is already part of the insert command. (for example, if you were inserting a whole new clause, you wouldn't list all the subclauses...)

SuggestedRemedy

Delete ", 45.2.1.60.f.x,"

Response **Response Status C**

ACCEPT.

Cl 45 **SC 45.2.1.250b** **P48** **L51** # **159**

Regev, Alon Keysight

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

The introductory sentence calls register 1.2319 the "MultiGBASE-A PMA supported rates register", but the register and table title (and subclause heading) is "MultiGBASE-A PMA rate negotiation register".

SuggestedRemedy

Change "supported rates register" to "rate negotiation register" to match the register/table title.

Response **Response Status C**

ACCEPT.

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CI 45 **SC 45.2.1.250b.1** **P49** **L25** # **160**

Regev, Alon Keysight

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

Bit references use a colon instead of a period (e.g. "1.2319:5:4" instead of "1.2319.5:4"). More significantly, subclause 45.2.1.250b.2 ("Negotiated PHY_S Transmit rate") states "When bits 1.2319:5:4 are not 000..." but 1.2319.5:4 is the PHY_D transmit-rate field described in the previous subclause (250b.1) whereas this subclause is about the PHY_S field, 1.2319.3:1.

SuggestedRemedy

Change "1.2319:5:4" to "1.2319.3:1" in 45.2.1.250b.2, and correct the colon-vs-period typos elsewhere in this bit-field block.

Response **Response Status C**

ACCEPT IN PRINCIPLE.

The colons that should be periods are:

P49L25 - 2x
1.2319:5:4 - > 1.2319.5:4

P49L32
1.2319:3:1 - > 1.2319.3:1
1.2319:5:4 - > 1.2319.3:1

CI 45 **SC 45.2.1.250c.2** **P51** **L1** # **161**

Regev, Alon Keysight

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

subclauses 45.2.1.250c.2 / .3 / .4 each state "bit 1.2318.14/.13/.12 indicates that the link partner supports...". these subclauses should cite 1.2320.14/.13/.12.

SuggestedRemedy

Replace "1.2318" with "1.2320" in 45.2.1.250c.2, .250c.3, and .250c.4.

Response **Response Status C**

ACCEPT.

CI 45 **SC 45.2.1.250c.2** **P51** **L3** # **56**

Zherebtsov, Aleksei Infineon

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

45.2.1.250c defines register 1.2320, MultiGBASE-A PMA link partner rate negotiation. The titles of 45.2.1.250c.2, 45.2.1.250c.3 and 45.2.1.250c.4 name bits 1.2320.14, 1.2320.13 and 1.2320.12, and the register table on page 50 lists the same bits in 1.2320, but the body text of all three subclauses describes bits of register 1.2318, which is the local MultiGBASE-A PMA rate ability register of 45.2.1.250a. Six sentences are affected: page 51 lines 3, 4, 9, 10, 15 and 16. The neighbouring subclauses 45.2.1.250c.1 and 45.2.1.250c.5 through 45.2.1.250c.10 cite 1.2320 correctly. As written, the same register bits are given two different meanings, local ability and link partner ability, which makes the rate negotiation ambiguous.

SuggestedRemedy

In 45.2.1.250c.2 replace both occurrences of "1.2318.14" with "1.2320.14". In 45.2.1.250c.3 replace both occurrences of "1.2318.13" with "1.2320.13". In 45.2.1.250c.4 replace both occurrences of "1.2318.12" with "1.2320.12".

Response **Response Status C**

ACCEPT.

CI 45 **SC 45.2.3** **P52** **L13** # **15**

Wienckowski, Natalie IVN Solutions LLC; Ethernova, Bosch

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

BASE-T1 OAM registers are also used by MultiGBASE-T1 OAM

SuggestedRemedy

Add note "b" reference to 3.2308, 3.2309 through 3.2312, and 3.2313 register names.

Response **Response Status C**

ACCEPT IN PRINCIPLE.

Change note "a" to: This register applies to BASE-T1, MultiGBASE-T1, 100M+MultiGBASE (-T1 and -V1), MultiG+100MBASE (-T1 and -V1), MultiGBASE-AT1, and MultiGBASE-AV1 PHYs with optional OAM capability.

Put reference to note a on registers that point to 45.2.3.79, 45.2.3.80, 45.2.3.81, and 45.2.3.82.

Change note "b" to: This register applies to MultiGBASE-T1, 100M+MultiGBASE (-T1 and -V1), MultiG+100MBASE (-T1 and -V1), MultiGBASE-AT1, and MultiGBASE-AV1 PHYs with optional OAM capability.

Put reference to note b on registers that point to 45.2.3.83, 45.2.3.84, 45.2.3.85, 45.2.3.86, and 45.2.3.87.

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Cl 45 **SC 45.2.3** **P52** **L20** # **120**

Muma, Scott Microchip

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

MultiGBASE-A PHYs also use registers 3.2322-3.2324, so add a footnote indicator for those registers too

SuggestedRemedy

Add footnote "a" to registers 3.2322-3.2324 in Table 45-233

Response **Response Status C**

ACCEPT IN PRINCIPLE.

Accommodated by #15.

Cl 46 **SC 46.1.3** **P54** **L43** # **87**

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

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

There is no MAC data rate of 7.5 Gb/s. 7.5 Gb/s PHYs use a MAC configuration set up for 10 Gb/s per table 4-2. The text change in 46.1.3 suggests otherwise.

SuggestedRemedy

Change "The XGMII supports MAC data rates of 2.5 Gb/s, 5 Gb/s, 7.5 Gb/s, and 10 Gb/s as defined within this clause." to "The XGMII supports MAC configurations for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s as defined in Table 4-2. It also supports Physical Layers rates of 7.5 Gb/s when used connected to a MAC configured for 10 Gb/s and when used with an asymmetric Physical Layer with 100 Mb/s in the other direction. A compliant device may implement any subset of these rates."

At P56 L10, Change feature of PICS G1a (46.6.3.1) to "Support of a Physical Layer rate of 7.5 Gb/s to a MAC configured for 10 Gb/s operation when used with an asymmetric Physical Layer with 100 Mb/s in the other direction."

Response **Response Status W**

ACCEPT IN PRINCIPLE.

Change: The XGMII supports MAC data rates of 2.5 Gb/s, 5 Gb/s, 7.5 Gb/s, and 10 Gb/s as defined within this clause. A compliant device may implement any subset of these rates. Symmetric operation at 10 Mb/s and 100 Mb/s is supported by the MII defined in Clause 22 and operation at 1000 Mb/s by the GMII defined in Clause 35. The XGMII supports symmetric operation with a MAC data rate of 2.5 Gb/s, 5 Gb/s, 7.5 Gb/s, or 10 Gb/s. The XGMII supports asymmetric operation with a MAC data rate of 100 Mb/s in the transmit or receive path and at least one of the specified multigigabit rates in the other one.

To: The XGMII supports the transmit and receive data rate combinations listed in Table 46-a as defined within this clause. A compliant device may implement any subset of these rate combinations. The MAC is configured using the parameters defined in Table 4-2 for data rates of 2.5 Gb/s, 5 Gb/s, or 10 Gb/s, or, in the case of asymmetric PHYs, for 100 Mb/s, as appropriate. Symmetric operation at 10 Mb/s and 100 Mb/s is supported by the MII defined in Clause 22 and operation at 1000 Mb/s by the GMII defined in Clause 35.

See comment_87.jpg for Table 46-a proposal.

At P56 L10, Delete PICS G1a (46.6.3.1) as this is not a symmetric MAC data rate.

Update PICS to match text.

In 46.1, P54L9, remove 7.5 Gb/s as this is not a symmetric data rate.

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CI **46** *SC* **46.1.3** *P* **54** *L* **47** # **88**

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

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

Specifying 7.5 Gb/s symmetric operation is not added by this amendment nor is it within the scope of 802.3dm.

SuggestedRemedy

At P54 L47 (46.1.3) Delete the added sentence "The XGMII supports symmetric operation..." and change the sentence beginning "The XGMII supports asymmetric operation..." to begin "In addition to supporting symmetric operation at 2.5 Gb/s, 5 Gb/s, and 10 Gb/s, the XGMII supports asymmetric operation..." and change "The XGMII supports asymmetric operation with a MAC data rate of 100 Mb/s in the transmit or receive path and at least one of the specified multigigabit rates in the other one." to "The XGMII supports asymmetric operation with a MAC data rate of 100 Mb/s in the transmit or receive path when connected to a PHY with 2.5 Gb/s, 5 Gb/s, 7.5 Gb/s, or 10 Gb/s in the other one." (preferred solution)

OR, alternatively, At P54 L47 (46.1.3), Delete ", 7.5 Gb/s" from "supports symmetric operation with a MAC data rate of 2.5 Gb/s, 5 Gb/s, 7.5 Gb/s, or 10 Gb/s."

In either case, additionally, change PICS:

P55 L43 (46.6.2.3) ADD new major feature PICS Item 7.5G, Subclause 46.1, Value/Comment "7.5 Gb/s support with asymmetric PHYs", Status: ASM:O, Support Yes/No (note this overwrites another comment to add this feature if this comment is accepted)

P55 L12 (46.3.1.1) Change "When interfacing to a PHY with a 7.5 Gbps transmit", to "When interfacing to an asymmetric PHY with a 7.5 Gb/s transmit"

P55 L24 (46.3.2.1) Change "When interfacing to a PHY with a 7.5 Gbps receive", to "When interfacing to an asymmetric PHY with a 7.5 Gb/s receive"

P56 L10, Change feature of PICS G1a (46.6.3.1) to "Support of a Physical Layer rate of 7.5 Gb/s to a MAC configured for 10 Gb/s operation when used with an asymmetric Physical Layer with 100 Mb/s in the other direction." (note - this change is also made in another comment)

P56 L10 (46.6.3.1) change PICS G1a Value to add "for asymmetric PHYs" after existing statement, and change status to PHY * ASM:O.1

P56 L33, (46.6.3.1) delete 7.5 Gb/s from the Value/Comment in PICS G3c

P57 L11 and L21 (46.6.3.6): Change "XGE:M <new line> *!7.5G " to "XGE * !7.5G:M" (this is repeated in the other comment for completeness, but is the same)

P57 L17 and L27 (46.6.3.6): Change "XGE:M <new line> *7.5G" to "XGE*7.5G:M"(this is repeated in the other comment for completeness, but is the same)

Response *Response Status* **W**

ACCEPT IN PRINCIPLE.

Accommodated by #87.

CI **46** *SC* **46.3.1.1** *P* **55** *L* **12** # **89**

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

Comment Type **E** *Comment Status* **A** *MAC*

badly worded text can be improved: "even though interfacing is to a MAC parameterized for 10 Gb/s as described in Table 4-2."

SuggestedRemedy

At P55 L12: Change "even though interfacing is to a MAC parameterized for 10 Gb/s as described in Table 4-2." to

"when interfacing is to a MAC parameterized for 10 Gb/s as described in Table 4-2."

Make the same change in 46.3.2.1 at P55 L26

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Accommodated by #113 and #114.

CI **46** *SC* **46.3.1.1** *P* **55** *L* **12** # **113**

Muma, Scott Microchip

Comment Type **T** *Comment Status* **A** *MAC*

The word "shall" here is redundant with the previous sentence but creates a redundant PICS items so should be unified.

SuggestedRemedy

Change "shall use" to "uses" and delete PICS item FS2a on P57L16. Change FS2 Status to XGE:M

Response *Response Status* **C**

ACCEPT IN PRINCIPLE.

Change: The TX_CLK frequency shall be $1/64 \times f_{MAC} \pm 100$ ppm, where f_{MAC} is the frequency (in Hz) corresponding to the MAC's nominal MAC bit rate that the RS provides in the transmit direction (2.5 Gb/s, 5 Gb/s, 7.5 Gb/s, 10 Gb/s, or 100 Mb/s).When interfacing to a PHY with a 7.5 Gbps transmit bit rate, the TX_CLK frequency calculation shall use 7.5 GHz in place of f_{MAC} , even though interfacing is to a MAC parameterized for 10 Gb/s as described in Table 4-2.

To: The TX_CLK frequency shall be $1/64 \times f_{MAC} \pm 100$ ppm, where f_{MAC} is the frequency (in Hz) corresponding to the PHY's transmit data rate selected from Table 46-a.

Delete PICS FS2a.

FS2:

Change the Value/Comment to match the updated text.

Change the Status to be: XGE:M

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general

COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

SORT ORDER: Clause, Subclause, page, line

CI **46**
SC **46.3.1.1**

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P802.3dm D2.1 Asymmetrical Electrical Automotive Ethernet 1st Working Group recirculation ballot comn

CI 46 **SC 46.3.2.1** **P55** **L25** # **114**

Muma, Scott Microchip

Comment Type T **Comment Status A** **MAC**

The word "shall" here is redundant with the previous sentence but creates a redundant PICS items so should be unified.

SuggestedRemedy

Change "shall use" to "uses" and delete PICS item FS9a on P57L26. Change FS9 Status to XGE:M

Response **Response Status C**

ACCEPT IN PRINCIPLE.

Change: The TX_CLK frequency shall be $1/64 \times f_{MAC} \pm 100$ ppm, where fMAC is the frequency (in Hz) corresponding to the MAC's nominal MAC bit rate that the RS provides in the transmit direction (2.5 Gb/s, 5 Gb/s, 7.5 Gb/s, 10 Gb/s, or 100 Mb/s). When interfacing to a PHY with a 7.5 Gbps receive bit rate, the RX_CLK frequency calculation shall use 7.5 GHz in place of fMAC, even though interfacing is to a MAC parameterized for 10 Gb/s as described in Table 4-2.

To: The frequency of RX_CLK may be derived from the received data or it may be that of a nominal clock (e.g., TX_CLK). When the received data rate at the PHY is within tolerance, the RX_CLK frequency shall be $1/64 \times f_{MAC} \pm 100$ ppm, where fMAC is the frequency (in Hz) corresponding to the PHY's receive data rate selected from Table 46-a.

Delete PICS FS9a.

FS9:
Change the Value/Comment to match the updated text.
Change the Status to be: XGE:M

CI 46 **SC 46.6.2.3** **P55** **L43** # **296**

Muma, Scott Microchip

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

Given that XGMII currently supports one or more symmetric data rates it follows that the XGMII can support both one or more asymmetric and symmetric data rates. So asymmetric data rates should be in the same group of options as symmetric data rates (PHY:O.1).

SuggestedRemedy

Change ASM to *ASM and change the Status of *ASM to PHY:O.1

Response **Response Status C**

ACCEPT IN PRINCIPLE.

Supceded by #297.

CI 46 **SC 46.6.2.3** **P55** **L43** # **91**

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

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

Major option for 7.5G is missing in options definitions, but used later in FS2a and FS9a, where the status is also missing...

SuggestedRemedy

P55 L43 (46.6.2.3) ADD new major feature PICS Item 7.5G, Subclause 46.1, Value/Comment "7.5 Gb/s support", Status: O, Support Yes/No (note this is overwritten by more extensive comment limiting 7.5G to asymmetry if the changes in that comment are accepted - but something is needed here nonetheless)
P57 L11 and L21 (46.6.3.6): Change "XGE:M <new line> *!7.5G " to "XGE *!7.5G:M" (this is repeated in the other comment for completeness, but is the same)
P57 L17 and L27 (46.6.3.6): Change "XGE:M <new line> *7.5G" to "XGE*7.5G:M"(this is repeated in the other comment for completeness, but is the same)

Response **Response Status C**

ACCEPT IN PRINCIPLE.

Supceded by #87, #113, #114, and #297.

P802.3dm D2.1 Asymmetrical Electrical Automotive Ethernet 1st Working Group recirculation ballot comn

CI 46 SC 46.6.3.1 P56 L5 # 297

Muma, Scott

Microchip

Comment Type T Comment Status A late - PICS - pull

This comment supercedes comment #147 and assumes status of *ASM is PHY:O.1

An Asymmetric PHY must support at least one or more high speed rate in at least one direction AND simultaneously support a lower speed in the other direction. Listing out all the speeds as independent options makes this difficult to capture. Instead define a PHY_D Feature and a PHY_S Feature both with Status ASM:O.2 with reference to Clause 191 and Clause 192. Then define the 10 transmit speed/direction combinations:

TX100M Status: PHY_D:M
RX100M Status: PHY_S:M
TX2.5G Status: PHY_S:O.3
TX5G Status: PHY_S:O.3
TX7.5G Status: PHY_S:O.3
TX10G Status: PHY_S:O.3
RX2.5G Status: PHY_D:O.4
RX5G Status: PHY_D:O.4
RX7.5G Status: PHY_D:O.4
RX10G Status: PHY_D:O.4

SuggestedRemedy

Add *PHY_S and *PHY_D items to the major capabilities/options table in 46.6.2.3 following the *ASM item with the Status ASM:O.2 for both new items.

Add the following 10 speed/direction combination items to the table in 46.6.3.1:

TX100M Status: PHY_D:M
RX100M Status: PHY_S:M
TX2.5G Status: PHY_S:O.3
TX5G Status: PHY_S:O.3
TX7.5G Status: PHY_S:O.3
TX10G Status: PHY_S:O.3
RX2.5G Status: PHY_D:O.4
RX5G Status: PHY_D:O.4
RX7.5G Status: PHY_D:O.4
RX10G Status: PHY_D:O.4

with editorial license on Feature Subclause Value/Comment, deleting/replacing the current items G3a, G3b.

Response Response Status C

ACCEPT IN PRINCIPLE.

Delete 46.6.2 and subsections. ASM is no longer needed so updates are not needed.

See Comment_297.jpg for the update to the table in 46.6.3.1.

CI 46 SC 46.6.3.1 P56 L5 # 147

Muma, Scott

Microchip

Comment Type T Comment Status A PICS

An Asymmetric PHY must support at least one or more high speed rate in at least one direction AND simultaneously support a lower speed in the other direction. Listing out all the speeds as independent options makes this difficult to capture. Instead define a PHY_D Feature and a PHY_S Feature both with Status ASM:O.2 with reference to Clause 191 and Clause 192. Then define the 10 transmit speed/direction combinations:

TX100M Status: PHY_D:M
RX100M Status: PHY_S:M
TX2.5G Status: PHY_S:O.3
TX5G Status: PHY_S:O.3
TX7.5G Status: PHY_S:O.3
TX10G Status: PHY_S:O.3
RX2.5G Status: PHY_D:O.4
RX5G Status: PHY_D:O.4
RX7.5G Status: PHY_D:O.4
RX10G Status: PHY_D:O.4

SuggestedRemedy

Add *PHY_S and *PHY_D items to the major capabilities/options table in 46.6.2.3 following the *ASM item with the Status ASM*PHY:O.2 for both new items.

Add the 10 speed/direction combination items to the table in 46.6.3.1 as shown in the commen with editorial license on Feature Subclause Value/Comment, deleting/replacing the current items G3a, G3b.

Response Response Status C

ACCEPT IN PRINCIPLE.

Superseded by #297.

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CI 46 SC 46.6.3.1 P56 L20 # 90

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

Comment Type E Comment Status A PICS

PICS option #1 (O.1) refers to picking a single rate. This is a separate option group from the 100 Mb/s which is coupled to the asymmetric. Supporting 100M in either the transit or receive direction for asymmetric phys needs to be option 2 (or else not supporting asymmetric). Note to editors - since an XGMII may support a variety of options, so it is still OK for this to be O.n (even though I originally thought otherwise...)

SuggestedRemedy

Change "PHY O.1" to "PHY O.2" in Status of PICS G3a, G3b, and G3c

Response Response Status C

ACCEPT IN PRINCIPLE.

Superseded by #297.

CI 46 SC 46.6.3.1 P56 L20 # 146

Muma, Scott Microchip

Comment Type T Comment Status A PICS

An Asymmetric PHY must support 100M in at least the transmit direction or the receive direction, so the Status for G3a and G3b is confusing.

SuggestedRemedy

Change ASM:M PHY:O.1
To: ASM*PHY:O.2

Response Response Status C

ACCEPT IN PRINCIPLE.

Superseded by #297.

CI 46 SC 46.6.3.1 P56 L31 # 148

Muma, Scott Microchip

Comment Type T Comment Status A PICS

The Status IASM:M PHY:O.1 is confusing here. The Feature says the PHY does NOT do something, but then the Value/comment says it ONLY does something. I think the intent is that it's a symmetric PHY and symmetric PHYs would support the same data rate in both directions at the same time.

SuggestedRemedy

Assuming the above change is carried out to define the asymmetric PHYs, then symmetric PHYs can be defined by:

1. Delete item G3c
2. Change items G1, G1a, G2, G3 Feature from "in at least one direction" to "in both directions"
3. Change items G1, G1a, G2, G3 Value/comment to "Support symmetric MAC data rate of <data_rate>"
4. Change items G1, G1a, G2, G3 Status to "IASM*PHY:O.1"

Response Response Status C

ACCEPT IN PRINCIPLE.

1. See #297 for new rows for asymmetric speeds

2. Implement suggested change, exept delete G1a as we are not adding 7.5G as a symmetrical option.

3. Implement suggested change, exept delete G1a as we are not adding 7.5G as a symmetrical option.

For 4. Revert items G1, G2, G3 Status back to "PHY:O.1" as in 802.3-2022.

CI 46 SC 46.6.3.6 P57 L14 # 145

Muma, Scott Microchip

Comment Type T Comment Status A PICS

The Value/comment for FS2 is ambiguous, it is not clear what the RS is providing here without rewording. Sugget just revert to original Clause 46 wording and indicate the MAC's nominal transmit rate to clarify that transmit rate and receive rate may be independent.

SuggestedRemedy

Change: the frequency (in Hz) corresponding to the nominal MAC bit rate that the RS provides in the transmit direction

To: the frequency (in Hz) corresponding to the MAC's nominal transmit bit rate

Response Response Status C

ACCEPT IN PRINCIPLE.

Accommodated by #113.

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Cl 46 SC 46.6.3.6 P57 L24 # 144

Muma, Scott

Microchip

Comment Type T Comment Status A PICS

The Value/comment for FS9 says the RS provides RX_CLK which is incorrect, RX_CLK is source by the PHY.

SuggestedRemedy

Change: corresponding to the nominal MAC bit rate that the RS provides in the receive direction

To: corresponding to the MAC's nominal receive bit rate

Response Response Status C

ACCEPT IN PRINCIPLE.

Accommodated by #114.

Cl 98 SC 98 P58 L1 # 60

Zherebtsov, Aleksei

Infineon

Comment Type E Comment Status A EZ

The running header of pages 58 to 64 and 312 to 317 names the draft "IEEE Draft P802.3/D2.1", while the running header of the remaining pages names it "IEEE Draft P802.3dm/D2.1". The draft designation should be the same on every page.

SuggestedRemedy

Correct the running header of pages 58 to 64 and 312 to 317 to read "IEEE Draft P802.3dm/D2.1".

Response Response Status C

ACCEPT.

Val to update header in 31B.

Cl 98 SC 98.3 P61 L51 # 7

Wienckowski, Natalie

IVN Solutions LLC; Ethernovia, Bosch

Comment Type E Comment Status A EZ

The title of Table 98-7 should have been updated when the title of Clause 98 was updated.

SuggestedRemedy

Change: State diagram variable to Single_-lane_*twisted-pair* media Auto-Negotiation MDIO register mapping

To: State diagram variable to *Single twisted-pair media*_Clause 98_ Auto-Negotiation MDIO register mapping

Where text between *x* is in strikethrough and text between _x_ is in underline.

Response Response Status C

ACCEPT.

Cl 98 SC 98.5.1 P62 L7 # 151

Muma, Scott

Microchip

Comment Type T Comment Status A EZ - pull

By using T1/V1 here it seems to imply that a -T1 PHY can autonegotiate with a -V1 PHY. That doesn't seem to be the intention based on the PICS.

SuggestedRemedy

Provide separate -V1 and -T1 signal sources.

Response Response Status C

ACCEPT IN PRINCIPLE.

Add a new sentence after the list: If the MDI connects to a single-ended unbalanced medium, only the V1 types are used. If the MDI connects to a balanced differential medium, only the T1 types are used.

Cl 98 SC 98.5.1 P62 L11 # 162

Regev, Alon

Keysight

Comment Type E Comment Status A EZ

Extra "T1" in "2.5GigT1+100MT1/V1", "5GigT1+100MT1/V1", and "10GigT1+100MT1/V1"

SuggestedRemedy

change "2.5GigT1+100MT1/V1" to "2.5Gig+100MT1/V1"

change "5GigT1+100MT1/V1" to "5Gig+100MT1/V1"

change "10GigT1+100MT1/V1" to "10Gig+100MT1/V1"

Response Response Status C

ACCEPT.

Cl 98 SC 98.5.1 P62 L15 # 149

Muma, Scott

Microchip

Comment Type T Comment Status A EZ - pull

The updates to 98.2.4.2 now clarify the priority resolution function so it doesn't need to be redefined in this note. If needed, the note can just point the reader to 98.2.4.2.

SuggestedRemedy

Delete the note.

Response Response Status C

ACCEPT IN PRINCIPLE.

Change: the HCD values are complementary

To: the HCD values are compatible pairs (see 98B.4)

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CI 98 SC 98.6.4 P63 L41 # 163

Regev, Alon Keysight

Comment Type E Comment Status A EZ

A stray lowercase "l" appears immediately after "...as follows (unchanged rows not shown):" before the footnote rule.

SuggestedRemedy

Delete the stray "l" character.

Response Response Status C

ACCEPT.

CI 98B SC 98B.3 P318 L21 # 152

Muma, Scott Microchip

Comment Type T Comment Status D AN

The abilities here are defined as -T1/V1, but in Table 45–178 -T1 PHY ability is distinct from -V1 PHY ability. It doesn't seem like it is intended for -T1 PHYs to autonegotiate and interoperate with -V1 PHYs. Clause 98 does not allow different media types to autonegotiate.

SuggestedRemedy

Provide separate -V1 and -T1 technology ability field bits and modify/split Table 98B-2 accordingly into -T1 and -V1 priority resolution with editorial license.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Table 98B-1 doesn't have enough bits to separate -T1 and -V1. There is no reason to as these are mutually exclusive. Maybe we just add notes to Table 98B-1 and Table 98B-2.

CI 98B SC 98B.4 P318 L38 # 150

Muma, Scott Microchip

Comment Type T Comment Status D EZ - pull

I suspect there are 2 colliding updates here since the first 4 lines (L38-41) modify the first paragraph while the following 5 lines (L44-48) seem to then replace the same paragraph. As well the new paragraph on L44-48 seems to be redefining priority resolution which is now covered/updated in 98.2.4.2 so should not be redone here in case of disagreement. 98B.4 should only provide the compatible abilities in priority order.

SuggestedRemedy

Replace P318L38-48 with:

[Editing instruction: Replace the first paragraph of 98B.4 with the following paragraph]

Since a local device and a link partner may have multiple compatible abilities, a prioritization scheme exists to ensure that the highest common denominator ability is chosen. Table 98B–2 specifies the relative priorities of the technologies supported by the IEEE 802.3 Selector Field value, the priorities are listed from highest to lowest.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Change the Editing instruction to: Replace the content of 98B.4 with the following:

Replace the existing text in 98B.4 in D2.1 with the following: Since a local device and a link partner may have multiple abilities in common, a prioritization scheme exists to choose the highest common denominator (i.e., highest priority) ability. Table 98B–2 indicates the relative priorities of the technologies supported by the IEEE 802.3 Selector Field value. The technology with the lowest priority number (i.e., highest priority) is the resolved ability. When the Leader PHY and Follower PHY both indicate the Technology Ability present in a given row of Table 98B–2, that is considered a common ability. Table 98B–2 specifies the relative priorities of the technologies supported by the IEEE 802.3 Selector Field value.

Keep table 98B-2 the same as it is in D2.1.

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

Estrakh, Daniel Valens Semiconductors

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

Clause 191 and Clause 192 are two separate, non-interoperable PHY schemes for the same asymmetric automotive link application. This conflicts with the project's own basis: the CSD justifies the project on cost/power-constrained applications "requiring a targeted solution" (singular) — not two competing, mutually incompatible ones. Maintaining both schemes in the draft creates market fragmentation risk rather than adoption.

SuggestedRemedy

Select one of Clause 191 or Clause 192 as the standardized asymmetric automotive PHY scheme and remove the other from the draft.

Response *Response Status* **C**

REJECT.

There is no consensus within the CRG to make a change.

The PHYs in Clause 191 and Clause 192 present different feature sets which meet the distinct identities which meet different objectives approved by the WG. See https://iee802.org/3/dm/public/0326/Objectives_ISAAC_01_0326.pdf.

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

Cl **191** *SC* **191** *P* **65** *L* **5** # **110**

Muma, Scott Microchip

Comment Type **E** *Comment Status* **R** *nomenclature*

In previous PHY nomenclature 100 Mb/s is always indicated as just "100" not "100M". For example 100BASE-T, 100BASE-T1, etc. rather than 100MBASE-T1. So consider removing the "M" from 100M to be consistent with previous naming conventions.

SuggestedRemedy

Change "100M+" to "100+" and "100MBASE" to "100BASE" globally.

Response *Response Status* **C**

REJECT.

There is no consensus to make a change.

While the M is not traditionally included for 100M PHYs, the fact that there is a xG term makes it clearer if there is an yM term instead of a y term.

Cl **191** *SC* **191.1** *P* **65** *L* **15** # **106**

Jonsson, Ragnar Infineon

Comment Type **E** *Comment Status* **D** *nomenclature*

It is implied that the term "MultiG+100MBASE" only applies to the PCS, but it can be used with -V1 or -T1 and then it applies to the whole PHY. Same comment applies to "100M+MultiGBASE" in the following line.

SuggestedRemedy

Add lines for "MultiG+100MBASE-T1/V1" and "100M+MultiGBASE-T1/V1", showing them as PHY_S and PHY_D, respectively.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

191.1.1 has the definitions for PHY_D and PHY_S as a complete device. TFTD if this should be moved. It should not be repeated.

Cl **191** *SC* **191.1** *P* **65** *L* **19** # **8**

Wienckowski, Natalie IVN Solutions LLC; Ethernovia, Bosch

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

There are 20 instances of "shielded balanced" and 2 instances of "shielded, balanced". Make these consistent

SuggestedRemedy

Change: shielded, balanced
To: shielded balanced
Also on P67L30

Response *Response Status* **C**

ACCEPT.

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CI 191 SC 191.1 P65 L42 # 71

Ran, Adeo Cisco Systems

Comment Type T Comment Status A EZ

"Baud" is a unit, not the quantity. Per the style guide and precedent clauses (with very few exceptions) we should not use "Baud rate". The common term is "signaling rate" or alternatively "symbol rate".

SuggestedRemedy

Change "Baud rate" to "signaling rate" across the draft.

Response Response Status C

ACCEPT IN PRINCIPLE.

P65L42

Change: baud rates

To: signaling rates

P193L20 (Val)

Change: baud rate

To: symbol rate

P194L4 (Val)

Change: baud rate

To: symbol rate

P269L44 (Val)

Change: baud rate

To: symbol rate

CI 191 SC 191.1 P65 L42 # 92

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

Comment Type E Comment Status A EZ

The description of the spectral overlap and how the MultiGBASE-T1 PHYs is somewhat misleading (they aren't 'fully overlapped', and could use some improvement.

SuggestedRemedy

Change "Unlike frequency division techniques, the PHYs have full spectral overlap in the two transmit directions, but utilize the relatively narrow bandwidth of the Low Data Rate (LDR) signal to enable separation of the remote signal from the echo signal." to

"Unlike frequency division techniques, the PHYs use overlapped spectra in the two transmit directions, but utilize the relatively narrow bandwidth of the Low Data Rate (LDR) signal compared to the High Data Rate (HDR) signal to enable recovery of the remote signal in the presence of the local transmitter's echo."

Response Response Status C

ACCEPT.

CI 191 SC 191.1 P65 L43 # 107

Jonsson, Ragnar Infineon

Comment Type E Comment Status A EZ

The wording "full spectral overlap" is inaccurate and misleading, because the LS spectra only partially overlaps the HS spectra.

SuggestedRemedy

Drop the word "full" from "full spectral overlap"

Response Response Status C

ACCEPT IN PRINCIPLE.

AIP - accommodated by #92

CI 191 SC 191.1 P65 L47 # 93

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

Comment Type E Comment Status A EZ

The sentence describing the construction of the PHY names belongs in the 191.1.1 Nomenclature section, not in the 191.1 Overview.

SuggestedRemedy

Move "This clause defines multiple PHY types named according to <maximum transmit data rate>+<maximum receive data rate>BASE-T1/V1, where -T1 is for single differential balanced-pair media, and V1 is for single-ended unbalanced media." to be the first sentence in 191.1.1

Response Response Status C

ACCEPT.

CI 191 SC 191.1 P65 L47 # 108

Jonsson, Ragnar Infineon

Comment Type E Comment Status A EZ

The wording "maximum transmit data rate" and "maximum receive data rate" inaccurately describes the naming convention, especially considering the use of the term "MultiG" in this context, throughout the document.

SuggestedRemedy

Drop the word "maximum" from "maximum transmit data rate" and "maximum receive data rate".

Response Response Status C

ACCEPT.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general

COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

SORT ORDER: Clause, Subclause, page, line

CI 191

SC 191.1

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CI 191 SC 191.1 P65 L65 # 72

Ran, Adee

Cisco Systems

Comment Type E Comment Status A EZ

"The Clause 4 MAC parameters for the appropriate rate (multigigabit or 100 Mb/s) are used in conjunction with the PHYs described in this clause in conjunction with either the multigigabit (HS) path or the 100 Mb s (LS) path."

With two "in conjunction" in the same sentence, I can't understand what it means.

SuggestedRemedy

Simplify and clarify the sentence.

Response Response Status C

ACCEPT IN PRINCIPLE.

P65L52

Change: The Clause 4 MAC parameters for the appropriate rate (multigigabit or 100 Mb/s) are used in conjunction with the PHYs described in this clause in conjunction with either the multigigabit (HS) path or the 100 Mb/s (LS) path.

To: The PHYs described in this clause use the Clause 4 MAC parameters for the appropriate rate multigigabit (HS path) or 100 Mb/s (LS path).

CI 191 SC 191.1.1 P67 L30 # 9

Wienckowski, Natalie

IVN Solutions LLC; Ethernovia, Bosch

Comment Type E Comment Status A EZ

P67L30-39 is redundant with P65L17-21

SuggestedRemedy

Delete P67L30-39

Response Response Status C

ACCEPT.

If this is pulled, #73 also has to be pulled.

CI 191 SC 191.1.1 P67 L67 # 73

Ran, Adee

Cisco Systems

Comment Type E Comment Status A EZ

Comment 5 against D2.0 suggested changes to the text to make it explain the nomenclature to the reader, rather than instruct them how to use it.

The comment was resolved with AIP, stating that the text in question is being deleted. But it has not been deleted and the issue in the comment persists. Thus, I am resubmitting the comment.

SuggestedRemedy

Change from

"For all PHYs communicating on a shielded, balanced, pair of conductors, regardless of transmit bit rate, use: MultiG+100M/100M+MultiGBASE-T1"

to

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

Make similar changes to the text describing the other terms.

Response Response Status C

ACCEPT IN PRINCIPLE.

"P67L30

This text is deleted by #9"

CI 191 SC 191.1.3.2 P73 L39 # 61

Pandey, Sujan

Velinktech

Comment Type E Comment Status R EZ

add a sentence after "The LS_RX PCS reverses the above process"

SuggestedRemedy

The LS_RX PCS reverses the above process as defined below

Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

P802.3dm D2.1 Asymmetrical Electrical Automotive Ethernet 1st Working Group recirculation ballot comn

CI 191 SC 191.1.3.2 P73 L41 # 62
 Pandey, Sujan Velinktech
 Comment Type E Comment Status R EZ
 add an variable assignment for receiver
 SuggestedRemedy
 rx_group4x65B<65xi+j> = rx_codedi<j>
 Response Response Status Z
 REJECT.
 This comment was WITHDRAWN by the commenter.

CI 191 SC 191.1.4 P74 L26 # 94
 Zimmerman, George CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,
 Comment Type E Comment Status A EZ
 Missing articles. The text change in the first sentence of 191.1.4 and 191.1.4 to reference the HS_TX(and LS_TX) PCS, rather than the signaling requires an article.
 SuggestedRemedy
 at P74 L26 (191.1.4): Change "HS_TX PCS" to "The HS_TX PCS" at the start of 191.1.4
 at P74 L52 (191.1.5): Change "LS_TX PCS" to "The LS_TX PCS" at the start of 191.1.5
 Response Response Status C
 ACCEPT.

CI 191 SC 191.1.4 P74 L35 # 63
 Pandey, Sujan Velinktech
 Comment Type E Comment Status R EZ
 No correlation between the HS_PATH and LS_PATH symbol stream
 SuggestedRemedy
 No correlation between the HS_PATH and LS_PATH symbol stream through two different scrambler polynomials at both transmitters
 Response Response Status Z
 REJECT.
 This comment was WITHDRAWN by the commenter.

CI 191 SC 191.1.4 P74 L40 # 10
 Wienckowski, Natalie IVN Solutions LLC; Ethernovia, Bosch
 Comment Type T Comment Status A EZ
 Polarity swap is not limited to the balanced pair. Comment #152 corrected this in 191.5.2.3, but this issue is in the draft in another place.
 SuggestedRemedy
 Delete: in the connection for the single balanced pair of conductors (-T1)
 Response Response Status C
 ACCEPT.

CI 191 SC 191.2.2 P77 L16 # 95
 Zimmerman, George CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,
 Comment Type T Comment Status A EZ
 The parameter passed from the PCS to the PMA to isn't rfer_cnt - it is hi_rfer (see the PHY Control state diagram). All of the block diagrams incorrectly show this as rfer_cnt. The count is used within the RFER monitor state diagram to produce hi_rfer. The definition of the parameter in 191.2.2.1 is right, just the name is wrong nearly everywhere. Note - this parameter was missing from the diagrams in clause 149, and we added it to fix the omission. It appears to be correct in Clause 192.
 SuggestedRemedy
 Change rfer_cnt to hi_rfer at:
 P71L11 Figure 191-3 and P72L11 Figure 191-4
 P77 L16 (191.2.2), P84L24, L26, L34,and L44 (191.2.2.10.1)
 P86L15 Figure 191-7, and L49 Figure 191-8
 P100L10 (191.3.5.1.2)
 P120 L3 Figure 191-28
 Response Response Status C
 ACCEPT.

CI 191 SC 191.2.2.1.1 P80 L9 # 64
 Pandey, Sujan Velinktech
 Comment Type E Comment Status A EZ
 Z Symbols term is used for the first time but lack reference for its defination
 SuggestedRemedy
 This value is continuously asserted when transmission of Z symbol (see 191.7.2.7) is required
 Response Response Status C
 ACCEPT.

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CI 191 SC 191.2.2.3.1 P81 L16 # 65

Pandey, Sujan Velinktech

Comment Type E Comment Status D EZ - pull

The term "normal operation" is defined multiple places in the draft with no clear meaning.
So replace it with data mode (SEND_N).

SuggestedRemedy
data mode (SEND_N)

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Change: normal operation
To: data mode
on P69L51, P81L16, P81L17, P81L25, P140L34, P140L37, P146L8, P147L47, P150L20, P150L24, P153L12, P164L47, P182L20, P182L39, P184L46, P185L11, P188L16, P290L31, P311L37

CI 191 SC 191.2.2.3.1 P81 L17 # 66

Pandey, Sujan Velinktech

Comment Type E Comment Status D EZ - pull

The term "normal operation" is defined multiple places in the draft with no clear meaning.
So replace it with data mode (SEND_N).

SuggestedRemedy
data mode (SEND_N)

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Change: normal operation
To: data mode
on P69L51, P81L16, P81L17, P81L25, P140L34, P140L37, P146L8, P147L47, P150L20, P150L24, P153L12, P164L47, P182L20, P182L39, P184L46, P185L11, P188L16, P290L31, P311L37

CI 191 SC 191.2.2.3.1 P81 L25 # 67

Pandey, Sujan Velinktech

Comment Type E Comment Status D EZ - pull

The term "normal operation" is defined multiple places in the draft with no clear meaning.
So replace it with data mode (SEND_N).

SuggestedRemedy
data mode (SEND_N)

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Change: normal operation
To: data mode
on P69L51, P81L16, P81L17, P81L25, P140L34, P140L37, P146L8, P147L47, P150L20, P150L24, P153L12, P164L47, P182L20, P182L39, P184L46, P185L11, P188L16, P290L31, P311L37

CI 191 SC 191.2.2.5.3 P82 L35 # 58

Zherebtsov, Aleksei Infineon

Comment Type T Comment Status A EZ

The sentence reads "The effect of receipt of this primitive is specified in 191.5.2.3 for HS_RX and in 191.5.2.3 for LS_RX". The same subclause is cited for both receive paths. Either one subclause applies and the sentence should cite it once, or one of the two references has been lost in editing. The draft has a single PMA Receive function subclause, 191.5.2.3, but two PHY Control subclauses, 191.5.2.4 for HS_PATH and 191.5.2.5 for LS_PATH, so the reader cannot determine which was intended.

SuggestedRemedy
If a single subclause applies, change the sentence to "The effect of receipt of this primitive is specified in 191.5.2.3." If separate subclauses were intended, cite them explicitly, for example "The effect of receipt of this primitive is specified in 191.5.2.4 for HS_RX and in 191.5.2.5 for LS_RX."

Response Response Status C

ACCEPT IN PRINCIPLE.

Change: The effect of receipt of this primitive is specified in 191.5.2.3 for HS_RX and in 191.5.2.3 for LS_RX.

To: The effect of receipt of this primitive is specified in 191.5.2.3.

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CI 191	SC 191.2.2.6	P82	L35	# 11
Wienckowski, Natalie		IVN Solutions LLC; Ethernovia, Bosch		
Comment Type	T	Comment Status	A	EZ
PMA_PCSSTATUS.request refers to 149.2.2.6. 149.2.2.6.3 refers to 149.4.4.1 but it should refer to 191.5.2.6.1.				
SuggestedRemedy				
Bring 149.2.2.6 into 191.2.2.6 and update the reference. (Preferred as all other service primitives are included in the text in this section.)				
OR				
Change 191.2.2.6 to read: PMA_PCSSTATUS.request is as described in 149.2.2.6, with the exception that the refence to 149.4.4.1 in 149.2.2.6.3 is replaced with 191.5.2.6.1.				
Response	Response Status C			
ACCEPT IN PRINCIPLE.				
Make the change according to the first option.				

CI 191	SC 191.3.2	P85	L11	# 100
Zimmerman, George		CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,		
Comment Type	T	Comment Status	R	OAM
Is OAM optional, or is it mandatory? 191.3.2 & 191.4.2 say "optional PCS OAM" and 191.3.7 & 191.4.7 describe it as optional, and conditions the behavior on "When OAM is implemented", and all the OAM behavior PICS are marked optional on OAM. BUT, most other description of the PCS treats OAM as a mandatory capability (whether or not it is enabled or used), subject only to being turned on or off by advertisement (see, e.g., block diagrams without a note, description of the PCS and RS-FEC at 191.3.2.2 & 191.3.2.3 , Figures 191-11, 191-12, 191-14, 191-15 similarly. 191.4.2.2 & 191.4.4 Figures 191-21, 191-22, 191-23, 191-27 show OAM bits and framing same as mandatory functions).				
SuggestedRemedy				
Consider making support of OAM mandatory, but its use is enabled by the advertising bits. If it is mandatory support:				
Remove "an optional" from 191.3.2 (P85L11) and 191.4.2 (P108L22)				
Remove "optional" from the first sentence of 191.3.7 and 191.4.7 (P106L36 and P119L7)				
Change "When OAM is implemented" to "When OAM is enabled" in 191.3.7 and 191.4.7 (and P106L37 and P119L9)				
Remove option "OAM" from PICS, and remove all OAM: from statuses.				
Response	Response Status Z			
REJECT.				
This comment was WITHDRAWN by the commenter.				

CI 191	SC 191.3.2	P88	L 50	# 76
Ran, Adeel		Cisco Systems		
Comment Type	E	Comment Status	R	Editorial
The hierarchical structure of subclauses below 191.3.2 "PCS Transmit function" is unnatural. There are 23 subclauses at the same level (191.3.2.*). Several subclauses describe a control character and refer to previous clauses, while others describe functions such as interleaving and RS encoding with great detail. There should be a better structure. I realize that the structure is parallel to that of the existing 149.3.2.2, but it is a good opportunity to improve on that structure, and any work that is done in this project can be followed up in the revision project to improve the existing clause.				
SuggestedRemedy				
Restructure the hierarchy under 191.3.2.				
Response	Response Status C			
REJECT.				
No specific suggestion is provided by the commenter.				

CI 191	SC 191.3.2.2	P87	L23	# 164
Regev, Alon		Keysight		
Comment Type	E	Comment Status	A	EZ
"2.5GBASE-T1/V1" should be "2.5G+100MBASE-T1/V1"				
SuggestedRemedy				
Change "2.5GBASE-T1/V1" to "2.5G+100MBASE-T1/V1".				
Response	Response Status C			
ACCEPT.				

CI 191	SC 191.3.2.2	P87	L32	# 12
Wienckowski, Natalie		IVN Solutions LLC; Ethernovia, Bosch		
Comment Type	E	Comment Status	A	EZ
subject/verb agreement				
SuggestedRemedy				
Change: the subsequent functions of the PCS Transmit process takes L groups				
To: the subsequent functions of the PCS Transmit process take L groups				
Response	Response Status C			
ACCEPT.				

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CI 191 SC 191.3.2.2 P88 L14 # 165

Regev, Alon Keysight

Comment Type E Comment Status A EZ

"2.5G and 5" should be "2.5G and 5G"

SuggestedRemedy

Change "2.5G and 5" to "2.5G and 5G".

Response Response Status C

ACCEPT.

CI 191 SC 191.3.2.2 P88 L15 # 74

Ran, Adeo Cisco Systems

Comment Type E Comment Status A EZ

"and 5"

SuggestedRemedy

Change to "and 5G"

Response Response Status C

ACCEPT.

CI 191 SC 191.3.2.2 P88 L15 # 13

Wienckowski, Natalie IVN Solutions LLC; Ethernovia, Bosch

Comment Type E Comment Status A EZ

5 should be 5G

SuggestedRemedy

Change: 2.5G and 5
To: 2.5G and 5G

Response Response Status C

ACCEPT.

CI 191 SC 191.3.2.2 P88 L17 # 75

Ran, Adeo Cisco Systems

Comment Type E Comment Status A EZ - pull

"The value of L used by the transmitter is determined by the link partner and signaled during the PAM2 training mode Infocfield exchange"

It's not clear if the link partner determines the value of L chosen by the transmitter, or the link partner chooses the value of L and communicates it to the link partner, which should then use it.

SuggestedRemedy

Rephrase to clarify the intent.

Response Response Status C

ACCEPT IN PRINCIPLE.

Change: The value of L used by the transmitter is determined by the link partner and signaled during the PAM2 training mode Infocfield exchange.

To: PHY_D selects the value of L to be used by the PHY_S transmitter. This value is communicated via Infocfield exchange. Note, L is not used by the LS_PATH.

CI 191 SC 191.3.2.2.5 P90 L54 # 2

Lasry, Ariel Qualcomm Technologies, Inc.

Comment Type ER Comment Status A EZ-R

The referenced 149.3.2.2.5 includes the following text "2.5G/5G/10GBASE-T1" which is not relevant for clause 191

SuggestedRemedy

Add "With 2.5G/5G/10GBASE-T1 replaced with MultiG+100M/100M+MultiGBASE-T1/V1."

Response Response Status C

ACCEPT.

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CI 191 SC 191.3.2.2.19 P93 L39 # 284

Wang, Frank Realtek Semiconductor Corp.

Comment Type E Comment Status A EZ - pull

formatting: variables in Equation are usually italic.

SuggestedRemedy

Apply italic formatting to g_S and x in Equation (191-2).

Grant Editorial license to apply the similar changes (italic formatting) to all Equations.

Response Response Status C

ACCEPT IN PRINCIPLE.

Make the suggested change.

Grant editorial license to change all variables, in text, figures, or equations to "italics", as needed.

CI 191 SC 191.3.2.2.19 P94 L8 # 27

Gorshe, Steve Microchip

Comment Type E Comment Status R EZ - pull

Figure 191-13 should be updated similar to the Figure 192-11 updates that resulted from a D2.0 comment.

SuggestedRemedy

Since Figure 191-9 (pp. 88) shows the DSn[1] bits created by the XOR of Scrn[3] and Scrn[8], Figure 191-13 should be updated in the same manner as Figure 192-11 (pp. 218), including the output arrow and new note "NOTE —The output shown corresponds to Scrn[0]. The outputs corresponding to Scrn[3] and Scrn[8] are not shown."

Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

CI 191 SC 191.3.2.3 P97 L3 # 96

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

Comment Type E Comment Status A EZ

The name of the state diagram isn't the 'monitor state diagram' it is the RFER monitor state diagram.

SuggestedRemedy

P97L3 (191.3.2.3) In the second sentence of the second-to-last paragraph of 191.3.2.3, change "monitor state diagram" to "RFER monitor state diagram"

Response Response Status C

ACCEPT.

CI 191 SC 191.3.3 P98 L3 # 97

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

Comment Type E Comment Status A EZ

Parallel grammar/structure: The first sentence of the first paragraph in 191.3.3 has "the" for transmitter & channel, but lacks it for remote receiver

SuggestedRemedy

At P98 L3: change "and remote receiver" to "and the remote receiver"

Response Response Status C

ACCEPT.

CI 191 SC 191.3.5.1.2 P100 L6 # 37

Wienckowski, Natalie IVN Solutions LLC; Ethernova, Bosch

Comment Type E Comment Status A EZ - pull

A statement for when it is set FALSE is missing.

SuggestedRemedy

At the end of the block_lock definition add the sentence: Otherwise it is set FALSE.

Response Response Status C

ACCEPT IN PRINCIPLE.

Change: Boolean variable that is set TRUE by the PCS Synchronization process when it acquires block delineation.

To: Boolean variable indicating that the PCS Synchronization process has acquired block delineation.

Add at the end of the definition:

TRUE: The PCS Synchronization process has acquired block delineation.

FALSE: The PCS Synchronization process has not acquired block delineation.

P802.3dm D2.1 Asymmetrical Electrical Automotive Ethernet 1st Working Group recirculation ballot comn

CI 191 **SC 191.3.5.1.2** **P100** **L11** # **38**
Wienckowski, Natalie IVN Solutions LLC; Ethernovia, Bosch
Comment Type E **Comment Status A** *EZ - pull*
A statement for when it is set FALSE is missing.
SuggestedRemedy
At the end of the hi_rfer definition add the sentence: Otherwise it is set FALSE.
Response **Response Status C**
ACCEPT IN PRINCIPLE.

Change: Boolean variable that is set TRUE by the PCS Synchronization process when the rfer_cnt reaches 16 errors

To: Boolean variable indicating that there have been 16 or more uncorrectable RS-FEC errors

CI 191 **SC 191.3.5.1.2** **P100** **L24** # **39**
Wienckowski, Natalie IVN Solutions LLC; Ethernovia, Bosch
Comment Type E **Comment Status A** *EZ*
A statement for when it is set FALSE is missing.
SuggestedRemedy
At the end of the pcs_reset definition add the sentence: Otherwise it is set FALSE.
Response **Response Status C**
ACCEPT.

CI 191 **SC 191.3.5.1.2** **P100** **L38** # **40**
Wienckowski, Natalie IVN Solutions LLC; Ethernovia, Bosch
Comment Type E **Comment Status A** *EZ - pull*
A statement for when it is set FALSE is missing.
SuggestedRemedy
At the end of the rf_valid definition add the sentence: Otherwise it is set FALSE.
Response **Response Status C**
ACCEPT IN PRINCIPLE.

Change: Boolean indication that is set TRUE if received Reed-Solomon frame is valid.

To: Boolean variable indicating that the received Reed-Solomon frame is valid.

CI 191 **SC 191.3.5.1.3** **P101** **L14** # **255**
Wang, Frank Realtek Semiconductor Corp.
Comment Type E **Comment Status A** *EZ - pull*
formatting: apply "Justify", not "Align Left".
SuggestedRemedy
For R_BLOCK_TYPE, apply "Justify" to lines 13 ~ 28.
Response **Response Status C**
ACCEPT IN PRINCIPLE.

Justify is not used when defining the parameter values.

Justify P101 L27-28.

CI 191 **SC 191.3.5.1.3** **P101** **L23** # **256**
Wang, Frank Realtek Semiconductor Corp.
Comment Type E **Comment Status A** *EZ - pull*
improve readability: 2 additional commas.
SuggestedRemedy
change "0xE1 or 0xFF and all control characters are valid." to "0xE1, or 0xFF, and all control characters are valid."
Response **Response Status C**
ACCEPT IN PRINCIPLE.

Use semicolons to separate the comma separated list from the other items.

Change: The vector contains a data/ctrl header of 1, a block type field of 0x87, 0x99, 0xAA, 0xB4, 0xCC, 0xD2, 0xE1 or 0xFF and all control characters are valid.

To: The vector contains a data/ctrl header of 1; a block type field of 0x87, 0x99, 0xAA, 0xB4, 0xCC, 0xD2, 0xE1, or 0xFF; and all control characters are valid.

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CI 191 SC 191.3.5.1.3 P101 L40 # 257
Wang, Frank Realtek Semiconductor Corp.
Comment Type E Comment Status R EZ
formatting: apply "Justify", not "Align Left".
SuggestedRemedy
For T_BLOCK_TYPE, apply "Justify" to lines 40 ~ 51.
Response Response Status C
REJECT.
Justify is not used when defining the parameter values.

CI 191 SC 191.3.5.1.3 P101 L44 # 258
Wang, Frank Realtek Semiconductor Corp.
Comment Type E Comment Status A EZ - pull
improve readability: 2 additional commas and use /S/ for consistent.
SuggestedRemedy
Change: Any characters before the S character are valid control characters other than /O/, /S/ and /T/ or form a valid ordered set, and all characters following the /S/ are data characters.
To: Any characters before the /S/ are either valid control characters other than /O/, /S/, and /T/, or form a valid ordered set, and all characters following the /S/ are data characters.
Response Response Status C
ACCEPT IN PRINCIPLE.
Replace,
"Any characters before the S character are valid control characters other than /O/, /S/ and /T/ or form a valid ordered set, and all characters following the /S/ are data characters."
with,
"All characters following the /S/ are data characters. When the vector contains /S/ in its fifth character, the first four characters are valid control characters except
a) /S/ and /T/ cannot be one of the first four characters;
b) /O/ can only be one of the first four characters if it's part of a valid ordered set.

CI 191 SC 191.3.5.1.3 P101 L47 # 259
Wang, Frank Realtek Semiconductor Corp.
Comment Type E Comment Status A EZ - pull
improve readability: break into separate sentences.
SuggestedRemedy
Change "characters, all characters" to "characters. All characters"
Response Response Status C
ACCEPT IN PRINCIPLE.
Replace,
"The vector contains a /T/ in one of its characters, all characters before the /T/ are data characters, and all characters following the /T/ are valid control characters other than /O/, /S/ and /T/."
with,
"The vector contains a /T/ in one of its characters. All characters before the /T/ are data characters. Any characters following the /T/ are valid control characters, except for /O/, /S/, and /T/."

CI 191 SC 191.3.5.1.3 P101 L49 # 260
Wang, Frank Realtek Semiconductor Corp.
Comment Type E Comment Status A EZ - pull
comma is missing.
SuggestedRemedy
Change "/S/ and /T/." to "/S/, and /T/."
Response Response Status C
ACCEPT IN PRINCIPLE.
Accommodated by #259.

CI 191 SC 191.3.5.2 P104 L16 # 291
Lo, William Axonne Inc.
Comment Type E Comment Status A late - EZ
ENCODE(tx_raw), EBLOCK_T are underlined and not in same font as other text in Figure 191-19. The C and D labels also need changing.
SuggestedRemedy
Fix the fonts
Response Response Status C
ACCEPT.

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CI 191 SC 191.3.5.2 P104 L53 # 166

Regev, Alon Keysight

Comment Type T Comment Status A EZ

text states "...except for the transition from RX_WE to RX_E, which occurs immediately after the RX_WE processes are complete." RX_WE is an IEEE/LPI-only state from base Clause 149 (Figure 149-19). Clause 191 explicitly excludes LPI/EEE, and Figure 191-20 has no RX_WE state.

SuggestedRemedy

change
"It makes exactly one transition for each receive block processed except for the transition from RX_WE to RX_E, which occurs immediately after the RX_WE processes are complete."

to
"It makes exactly one transition for each receive block processed."

Response Response Status C

ACCEPT.

CI 191 SC 191.3.5.2 P105 L6 # 293

Lo, William Axonne Inc.

Comment Type E Comment Status A late - EZ

The arrow into RX_INIT is misaligned and pokes into the box. Also all the arrow heads do not all look like the same size.

SuggestedRemedy

Realign the arrow. Fix arrow head size

Response Response Status C

ACCEPT.

CI 191 SC 191.3.5.2 P105 L18 # 292

Lo, William Axonne Inc.

Comment Type E Comment Status A late - EZ

DECODE(rx_coded), EBLOCK_R are underlined and not in same font as other text in Figure 191-20. The C, D and E labels also need changing.

SuggestedRemedy

Fix the fonts

Response Response Status C

ACCEPT.

CI 191 SC 191.3.6.1 P106 L12 # 41

Wienckowski, Natalie IVN Solutions LLC; Ethernova, Bosch

Comment Type E Comment Status A EZ - pull

A statement for when it is set FALSE is missing.

SuggestedRemedy

At the end of the pcs_status definition add the sentence: Otherwise it is set FALSE.

Response Response Status C

ACCEPT IN PRINCIPLE.

P106L9

Change: Boolean variable that indicates whether the PCS is in a fully operational state. It is only TRUE if pcs_data_mode is TRUE, block_lock is TRUE, and hi_rfer is FALSE.

To: A parameter indicating whether the PCS is operating reliably in data mode and passed to the PMA via the PMA_PCSSTATUS.request primitive. pcs_status has a value of OK if pcs_data_mode is TRUE, block_lock is TRUE, and hi_rfer is false. Otherwise pcs_status has a value of NOT_OK.

Also, Val to update the description of pcs_status in 192.3.6.1 on P238L9 by changing:

Indicates whether the PCS is in a fully operational state. It is only TRUE if ...

To: Indicates the value of the pcs_status parameter defined in 192.2.1.5.1. pcs_status has a value of OK only if ...

CI 191 SC 191.3.7 P106 L34 # 192

van Dyck, Peter Infineon

Comment Type T Comment Status R OAM

Clause 191 OAM still includes RS(16,14) which is only needed for EEE, which was removed.

SuggestedRemedy

Pull in text from Clause 149.3.9 and modify similar to what was done in https://www.ieee802.org/3/dm/public/0726/8023-192_3_7%20-%20OAM%20edits.pdf.

OR

Modify 191.3.7 to add language indicating that RS(16,14) is not used and symbols 14 and 15 are reserved.

Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general

COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

SORT ORDER: Clause, Subclause, page, line

CI 191
SC 191.3.7

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CI 191 SC 191.4.2.2 P109 L19 # 28

Gorshe, Steve Microchip

Comment Type E Comment Status A EZ

Since "RS-FEC(50,46,6)" has already been introduced (pp. 79) and since the TF agreed to omit the symbol size from the in this form, it is better to use consistent RS-FEC language

SuggestedRemedy

Replace "(50,46,6) RS-FEC" with "RS-FEC(50,46)"

Response Response Status C

ACCEPT.

CI 191 SC 191.4.2.2.3 P111 L23 # 29

Gorshe, Steve Microchip

Comment Type E Comment Status A EZ

For consistency with the other 802.3 clauses, the TF agreed to omit the symbol size from the in this FEC form.

SuggestedRemedy

Delete the "6" from RS(50,46,6) in Figure 191-23 and other places in Clause 191.

Response Response Status C

ACCEPT.

CI 191 SC 191.4.2.2.15 P114 L13 # 285

Lo, William Axonne Inc.

Comment Type T Comment Status A late - CRC

The CRCout and the diagonal arrow supposed to mean something like a switch. This is a bit confusing and if this is not interpreted as a switch the picutre and the text do not produce the same results.

SuggestedRemedy

See Figure 191-32 for an example on how to fix this.

In line 8 add the sentence:

CRCgen is selected when computing the CRC and CRCout is selected when outputting the 6-bit CRC.

Response Response Status C

ACCEPT IN PRINCIPLE.

P115L10, Figure 191-25

Change the right side of Figure 191-25 for CRC6 to look like the right side of Figure 191-32 for CRC16.

Add the additional text requested to P115L8.

CI 191 SC 191.4.2.2.17 P116 L15 # 30

Gorshe, Steve Microchip

Comment Type E Comment Status R EZ - pull

Figure 191-26 should be updated similar to the Figure 192-11 updates that resulted from a D2.0 comment.

SuggestedRemedy

Since Figure 191-9 (pp. 88) shows the DS_n[1] bits created by the XOR of Scrn[3] and Scrn[8], Figure 191-26 should be updated in the same manner as Figure 192-11 (pp. 218), including the output arrow and new note "NOTE —The output shown corresponds to Scrn[0]. The outputs corresponding to Scrn[3] and Scrn[8] are not shown."

Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

CI 191 SC 191.4.2.3.3 P117 L32 # 109

Jonsson, Ragnar Infineon

Comment Type T Comment Status A EZ

The list is missing the case of bad CRC-6

SuggestedRemedy

Add one more item to the list: e) Detection of CRC-6 error (see 191.4.2.2.1.5).

Response Response Status C

ACCEPT.

CI 191 SC 191.4.4 P118 L12 # 14

Wienckowski, Natalie IVN Solutions LLC; Ethernovia, Bosch

Comment Type E Comment Status A EZ

Should use "six" not "6" due to the style manual and consistency.

SuggestedRemedy

Change: The 6 CRC bits

To: The six CRC bits

Response Response Status C

ACCEPT.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general

COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

SORT ORDER: Clause, Subclause, page, line

CI 191
SC 191.4.4

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CI 191 SC 191.5.2 P119 L40 # 303

Razavi, Alireza

Eliyan

Comment Type T Comment Status A late - PMA

191.5.2 states: "The PMA sublayer comprises one PMA Reset function and five simultaneous and asynchronous operating functions. The PMA operating functions are PHY Control, PMA Transmit, PMA Receive, Link Monitor, and Tx Clock Generation." This enumeration omits the PHY Link Synchronization function, which is defined as a PMA operating function in 191.5.2.8 with its own state diagram (Figure 191-38) and is shown as the LINK SYNCHRONIZATION functional block in the PMA reference diagram (Figure 191-28) on the same page. The count "five" and the list are inconsistent with both 191.5.2.8 and Figure 191-28, which together establish six PMA operating functions.

SuggestedRemedy

Change "five" to "six" and add PHY Link Synchronization to the list: "The PMA sublayer comprises one PMA Reset function and six simultaneous and asynchronous operating functions. The PMA operating functions are PHY Control, PMA Transmit, PMA Receive, Link Monitor, PHY Link Synchronization, and Tx Clock Generation." Also confirm whether the following sentence ("All operating functions are started immediately after the successful completion of the PMA Reset function") holds for PHY Link Synchronization, whose start is governed by the AN-enable condition per Figure 191-38; qualify it if not.

Response Response Status C

ACCEPT IN PRINCIPLE.

Make the proposed change in 191.5.2 and 191.4.2 (P230L49).

CI 191 SC 191.5.2.2 P121 L34 # 98

Zimmerman, George

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

Comment Type E Comment Status A EZ

The mention of "Z" just comes completely out of the blue, and reads as though Z is just one of the possibilities that the PMA might have in SEND_Z (as opposed to the only one).

SuggestedRemedy

At P121 L34, Change "When tx_mode is SEND_Z, see 191.7.2.7 for the encoding of "Z"." to "When tx_mode is SEND_Z, the PMA is receiving "Z" symbols from the PCS, muting the transmitter. See 191.7.2.7 for the PMA's encoding of "Z"."

Response Response Status C

ACCEPT.

CI 191 SC 191.5.2.2 P121 L36 # 99

Zimmerman, George

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

Comment Type E Comment Status D EZ - pull

The listing of functions of the transmitter gets complicated, possibly leading to confusion that both PHY_D and PHY_S only do DME in link synchronization (unless you carefully track the commas). It also isn't clear that the 'not in SEND_Z' applies to PHY_S in link sync. (which it does, but the PICS entry PMAT14 gets this wrong) Rewording can avoid confusion. Additionally, DME is already defined and used, no need to re-spell it out, and the discussion would be clearer if we stated that PAM is used for normal transmission for PHY_S here.

SuggestedRemedy

At P121 L35, change "When tx_mode is not SEND_Z, the PHY_D PMA Transmit function, and the PHY_S PMA Transmit function in link synchronization, shall encode binary values using Differential Manchester Encoding (DME)

according to the rules in 191.5.2.2.1." to "

When tx_mode is not in SEND_Z, a PHY_D PMA shall encode binary values using DME, and during link synchronization for a PHY_S PMA. When tx_mode is not SEND_Z, and link synchronization is not active, the PHY_S PMA Transmit function encodes binary values as PAM2 or PAM4 signals, as described above for the HS_TX PMA Transmit function."

At P178 L17 (191.15.4.3.2, PICS PMAT14) Change Value/Comment from "Encoding per 191.5.2.2.1 when not in SEND_Z, used by PHY_D. Used by PHY_S in link synchronization." to "When not in SEND_Z, encoding per 191.5.2.2.1. Used by PHY_D for all but SEND_Z. Used by PHY_S in link synchronization when not n SEND_Z."

Proposed Response Response Status W

PROPOSED ACCEPT.

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CI 191 SC 191.5.2.4.4 P123 L14 # 305

Razavi, Alireza

Eliyan

Comment Type T Comment Status A late - infocield

In Table 191-6 (Follower Message Field settings) and the associated ordering rules in 191.5.2.4.4 (HS_PATH) and 191.5.2.5.3 (LS_PATH), the Follower must progress such that timing_lock_OK is asserted in an earlier Infocield than loc_rcvr_status: row 2 (timing_lock_OK=1, loc_rcvr_status=0) is a mandatory intermediate step between row 1 and row 3. A Follower that achieves a stable transmit clock and OK local receiver status concurrently is still required to first transmit a Message Field with timing_lock_OK=1 and loc_rcvr_status=0, adding an unnecessary Infocield to startup. Separately, the current ordering rule ("the next Message Field setting shall be ... a row below the current setting") is ambiguous as to whether rows may be skipped and does not explicitly prohibit skipping to the COUNTDOWN row (PMA_state=01) before loc_rcvr_status and timing_lock_OK are set.

SuggestedRemedy

Permit, as an option, the Follower to assert loc_rcvr_status and timing_lock_OK in the same Message Field, while retaining the stepwise progression and prohibiting all other skips and any return to a prior row. (1) In 191.5.2.4.4 and 191.5.2.5.3, replace "the next Message Field setting shall be the same Message Field setting or the Message Field setting corresponding to a row below the current setting" with: "the next Message Field setting shall be either the same Message Field setting or the Message Field setting in the row immediately below the current setting, except that the Follower may advance from the first row of Table 191-6 directly to the third row, asserting loc_rcvr_status and timing_lock_OK in the same Message Field. The Message Field setting shall not change to a row above the current setting." (2) In 191.5.2.6, after "The setting of timing_lock_OK value is implementation specific.", add: "A Follower is permitted to assert timing_lock_OK in the same Message Field in which it first asserts loc_rcvr_status; it is not required to transmit a Message Field with timing_lock_OK = 1 and loc_rcvr_status = 0 beforehand. See 191.5.2.4.4 and 191.5.2.5.3." Table 191-6 is unchanged (all four rows remain valid); the receiver requires no change, as row 3 is already a valid received setting.

Response

Response Status C

ACCEPT.

CI 191 SC 191.5.2.4.5 P125 L14 # 286

Lo, William

Axonne Inc.

Comment Type T Comment Status A late - infocield

The OAMen and VendorSpecificData is not implemented correctly per my previous comment. I think this is a confusion conflating HS_PATH with PHY_S. They are not the same. In this section we are talking about HS_PATH. Explanation: Let AS be the OAMen advertised bit in PHY_S. Let RD be the bit in PHY_D that reflect the AS bit. In the other direction let AD be the OAMen advertised bit in PHY_D. Let RS be the bit in PHY_S that reflect the AD bit. Since this is the HS_PATH we need to talk about AS and RD, but instead we are talking about AS and RS here. What may be causing confusion in the text is that we assign 1.2311.1 to both AS and AD and 1.2312.1 to both RD and RS. Note that there is no need to assign the same address to AS and AD. But since AS and AD are in different devices we chose the same address out of symmetry. Similar for RD and RS. A similar issue is occurring for VendorSpecificData.

SuggestedRemedy

Change Line 14 from:
The link partner's OAMen is advertised
to:
The value of PHY_S OAMen is reported at the link partner (PHY_D)

Delete Line 19-20 and add:
The VendorSpecificData PHY_S sends to its link partner are bits 1.2316.15:0 (see 45.2.1.249). The value of PHY_S VendorSpecificData is reported at the link partner (PHY_D) in bits 1.2317.15:0 (see 45.2.1.250).

Response

Response Status C

ACCEPT IN PRINCIPLE.

Change Line 14 from:
The link partner's OAMen is advertised
to:
The value of PHY_S OAMen is reported at the link partner (PHY_D)

Line 19-20: Change: The VendorSpecificData the PHY sends to its link partner are bits 1.2316.15:0 (see 45.2.1.249). The VendorSpecificData received from the link partner are bits 1.2317.15:0 (see 45.2.1.250).

To: The VendorSpecificData PHY_S sends to its link partner are bits 1.2316.15:0 (see 45.2.1.249). The value of PHY_S VendorSpecificData is reported at the link partner (PHY_D) in bits 1.2317.15:0 (see 45.2.1.250).

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CI 191 SC 191.5.2.5.4 P127 L36 # 287

Lo, William

Axonne Inc.

Comment Type T Comment Status A late - infofield

Same problem as above but this time we don't even reference the address. As noted in the previous comment AS and AD do not necessarily need to be in the same register address and we cannot infer that, hence we need to state the details even though it may look like we are saying the same thing twice because we chose the same register address to represent AS and AD.

SuggestedRemedy

Line 37:

Remove the entire line and replace with:

OAMen indicates PHY_D OAM capability is enabled. The OAMen is advertised in bit 1.2311.1. (See 45.2.1.244.5 for the definition of bit 1.2311.1.) The value of PHY_D OAMen is reported at the link partner (PHY_S) in bit 1.2312.1. (See 45.2.1.245.4 for the definition of bit 1.2312.1.)

Insert the following at line 42.

The VendorSpecificData PHY_D sends to its link partner are bits 1.2316.15:0 (see 45.2.1.249). The value of PHY_D VendorSpecificData is reported at the link partner (PHY_S) in bits 1.2317.15:0 (see 45.2.1.250).

Delete line 28-29 and add:

The InterleaverDepth request PHY_D sends to its link partner is bits 1.2311.12:11 (see 45.2.1.244.1). The value of PHY_D InterleaverDepth reported at the link partner (PHY_S) in bits 1.2312.12:11 (see 45.2.1.245.1).

Delete line 35 and add:

The value of PHY_D PrecodeSel is reported at the link partner (PHY_S) in bit 1.2312.3:2 (see 45.2.1.245.3).

Response Response Status C

ACCEPT IN PRINCIPLE.

Line 28-29: Change: The InterleaverDepth request the PHY sends to its link partner is bits 1.2311.12:11 (see 45.2.1.244.1). The InterleaverDepth requested by the link partner is bits 1.2312.12:11 (see 45.2.1.245.1).

To: The InterleaverDepth request PHY_D sends to its link partner is bits 1.2311.12:11 (see 45.2.1.244.1). The value of PHY_D InterleaverDepth reported at the link partner (PHY_S) in bits 1.2312.12:11 (see 45.2.1.245.1).

Line 35: Change: The received PrecodeSel request is reported in bit 1.2312.3:2 (see 45.2.1.245.3) by the link partner.

To: The value of PHY_D PrecodeSel is reported at the link partner (PHY_S) in bit 1.2312.3:2 (see 45.2.1.245.3).

Line 37: Change: OAMen indicates PHY_D OAM capability is enabled.

To: OAMen indicates PHY_D OAM capability is enabled. The OAMen is advertised in bit 1.2311.1. (See 45.2.1.244.5 for the definition of bit 1.2311.1.) The value of PHY_D OAMen is reported at the link partner (PHY_S) in bit 1.2312.1. (See 45.2.1.245.4 for the definition of bit 1.2312.1.)

Insert the following at line 42.

The VendorSpecificData PHY_D sends to its link partner are bits 1.2316.15:0 (see 45.2.1.249). The value of PHY_D VendorSpecificData is reported at the link partner (PHY_S) in bits 1.2317.15:0 (see 45.2.1.250).

CI 191 SC 191.5.2.6.1 P130 L10 # 101

Zimmerman, George

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

Comment Type E Comment Status A EZ

There are two ways of referencing a variable definition elsewhere: "See x.x.x" or "This variable is defined in x.x.x.". Here we do See 98.5.1 - but just adjacent, two are "This variable is defined...". Be consistent in style - pick one.

SuggestedRemedy

Change "see 98.5.1" at P130 L10 to "This variable is defined in 98.5.1." at: P130L10 (191.5.2.6.1), P136 L31, 33, & 37, and P137 L13 (191.5.2.8.1), Change "see 98.5.2" to "This timer is defined in 98.5.2." at P137L20 (191.5.2.8.2).

At P231L42 (192.3.5.1.2 pcs_data_mode) change "See 192.2.1.8.1." to "This variable is defined in 192.2.1.8.1."

At P261L33 & P262L2, 33, 44, P263L36 (192.4.4.1 block_lock, hi_rfer, loc_rcvr_status, pcs_data_mode, and tx_mode) change "See " to "This variable is defined in " Editorial license to similarly clean up any other ones in clauses 191 or 192 that I missed.

Response Response Status C

ACCEPT.

CI 191 SC 191.5.2.6.1 P130 L39 # 102

Zimmerman, George

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

Comment Type E Comment Status A EZ

duplicate shall - the state diagram is called with a shall - variable descriptions shouldn't contain shall's. If the requirement needs to be tested as a PICS, the shall should be in text - however, this looks like it isn't needed, and "is" would be parallel with the rest of the text. - further, the "parameter" isn't set - it is a variable, and it has a value taken from a message.

SuggestedRemedy

change "shall be set to" to "is"

Response Response Status C

ACCEPT.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general

COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

SORT ORDER: Clause, Subclause, page, line

CI 191

SC 191.5.2.6.1

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CI 191 SC 191.5.2.6.1 P130 L51 # 42

Wienckowski, Natalie IVN Solutions LLC; Ethernovia, Bosch

Comment Type E Comment Status D EZ - pull

Comment #154 on D2.0 did not have a proper resolution so no change was made to this text. It referred to another comment that didn't impact this text.

SuggestedRemedy

Add the following to the training_failure definition:

TRUE: Training has not been successfully completed.

FALSE: Training has been successfully completed.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

TFTD - The proposal below was provided by another CRG member.

Add the following to the training_failure definition:

This variable is set TRUE when the training sequence is completed and did not successfully link up. Otherwise it is set FALSE.

CI 191 SC 191.5.2.8 P133 L33 # 301

Razavi, Alireza Eliyan

Comment Type T Comment Status D late - Link Sync

191.5.2.8 scopes Figure 191-38 to the case where Auto-Negotiation is disabled or not implemented, yet (a) the state diagram's global entry into SYNC_DISABLE and its power-up behavior depend on power_on, mr_main_reset, and mr_autoneg_enable, all defined by cross-reference to 98.5.1 (Clause 98 Auto-Negotiation). When AN is not implemented, Clause 98 is absent and these variables have no defined source, leaving the power-up entry undefined for a PHY that does not implement AN. (b) The diagram also handles the AN-enabled case (entry to SYNC_DISABLE on mr_autoneg_enable), which the scoping sentence assigns to Clause 98 - making it ambiguous whether this diagram or the Clause 98 state machine governs the PHY when AN is enabled.

SuggestedRemedy

Define power_on and mr_main_reset (and any reset/enable conditions the Link Synchronization machine requires) independently of 98.5.1 for the AN-not-implemented case, or state that they are instantiated regardless of whether Clause 98 is implemented. Clarify the handoff between Figure 191-38 and the Clause 98 state machine when mr_autoneg_enable is asserted, so the AN-enabled behavior is defined in exactly one place.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

P134L33

Update variable definitions in 191.5.2.8.1

mr_main_reset

When Auto-Negotiation is implemented, this variable is as defined in 98.5.1. When Auto-Negotiation is not defined or not implemented, mr_main_reset controls the resetting of the link synchronization state diagram.

Values:

false: do not reset the link synchronization state diagram

true: reset the link synchronization state diagram

power_on

When Auto-Negotiation is implemented, this variable is as defined in 98.5.1.

When Auto-Negotiation is not defined or not implemented, power_on is a condition that is true until such time as the power supply for the device has reached the operating region.

Values:

false: the device is completely powered (default)

true: the device has not been completely powered

mr_autoneg_enable

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general

COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

SORT ORDER: Clause, Subclause, page, line

CI 191

SC 191.5.2.8

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When Auto-Negotiation is implemented, this variable is as defined in 98.5.1.
When Auto-Negotiation is not defined or not implemented, mr_autoneg_enable is set to false.

CI 191	SC 191.5.2.8	P134	L32	# 128
Muma, Scott		Microchip		
Comment Type	T	Comment Status	A	Link Sync

The Link Synchronization function should conform to the state diagram independent of AN, it's the usage of the Link Synchronization function that is dependent on AN.

SuggestedRemedy

Change: If the optional Clause 98 Auto-Negotiation function is disabled or not implemented, then the Link Synchronization function shall conform to the state diagram in Figure 191–38.

To: If the optional Clause 98 Auto-Negotiation function is disabled or not implemented, then the Link Synchronization function shall be disabled. The Link Synchronization function shall conform to the state diagram in Figure 191–38.

Response	Response Status	C
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ACCEPT IN PRINCIPLE.

Change: If the optional Clause 98 Auto-Negotiation function is disabled or not implemented, then the Link Synchronization function shall conform to the state diagram in Figure 191–38.

To: The Link Synchronization function shall conform to the state diagram in Figure 191–38.

CI 191	SC 191.5.2.8	P135	L21	# 43
Zherebtsov, Aleksei		Infineon		
Comment Type	T	Comment Status	A	SEND_S

191.5.2.8 defines SEND_S only in the time domain: the 4 bit 1001 DME pattern, the 34.133 ns pulse, the 116 DME symbol periods of quiet, the 1024 ns interval, and the Leader and Follower handshake. It says nothing about the amplitude of the transmitted signal, and it has no cross reference to a subclause which constrains the amplitude. The level is constrained, but only in 191.6.2.6, 191.6.2.7, 191.7.2.7 and 191.7.2.8. It is found only by searching the whole clause for the string SEND_S. Link Synchronization is normally implemented by a different team than the transmitter electrical specification. We need a pointer here, otherwise an implementer who reads 191.5.2.8 alone has no indication that any level constraint applies at all. The low speed subclauses shall be the only ones which govern SEND_S. SEND_S is sent at the DME rate of the low speed path. The rate dependent levels of the high speed subclauses have no meaning during link synchronization, because no MultiG data is sent at that time. This needs two more edits. 191.6.2.7 states that its limits apply to SEND_S, so SEND_S shall be taken out of that sentence. Otherwise the two subclauses contradict each other for a 2.5 Gb/s PHY_S. Table 191-17 allows 0.8 V there and 191.7.2.8 allows 1.0 V. 191.7.2.8 names a 100M+MultiGBASE-T1 transmitter and applies when transmitting at a data rate of 100 Mb/s. A PHY_S never does that, so 191.7.2.8 shall be extended to a PHY_S transmitter as well. Without that extension a PHY_S would have no peak limit for SEND_S at all.

SuggestedRemedy

Make three changes. 1. In 191.5.2.8, page 135 line 21, insert the following sentence after the paragraph which defines the SEND_S pulse and which begins "A SEND_S pulse is defined to be a 4-bit pulse of 1001 mapped to DME symbols": "The SEND_S signal shall meet the transmitter peak output requirements of 191.7.2.8 and the transmitter power spectral density and power level requirements of 191.7.2.7." 2. In 191.6.2.7, page 147 lines 49 and 50, change "These limits apply to all transmitted symbol sequences, including SEND_S, SEND_T, and SEND_N." to "These limits apply to all transmitted symbol sequences other than SEND_S, including SEND_T and SEND_N." 3. In 191.7.2.8, page 155 line 3, insert the following sentence after the paragraph which ends "including SEND_S, SEND_T, and SEND_N.": "When transmitting SEND_S, the limits of this subclause apply to a PHY_S transmitter as well as to a PHY_D transmitter."

Response	Response Status	C
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ACCEPT IN PRINCIPLE.

Add new text on P135L24 as a new sentence at the end of the third paragraph of 191.5.2.8:

For the High Speed direction, when measured at the MDI using test fixture 4, the peak-to-peak differential output voltage for the SEND_S signal for -T1 shall be between 0.40 V and 1.5 V, and the peak-to-peak output voltage for the SEND_S signal for -V1 shall be between 0.20 V and 0.75 V. For the Low Speed direction, the peak-to-peak differential output voltage for the SEND_S signal for -T1 shall be between 0.45 V and 1.0 V, and the peak-to-peak output voltage for the SEND_S signal for -V1 shall be between 0.22 V and 0.50 V.

On P147L49 Change: These limits apply to all transmitted symbol sequences, including

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SEND_S, SEND_T, and SEND_N.

To: These limits apply to all transmitted symbol sequences other than SEND_S, including SEND_T, and SEND_N. The limits for SEND_S are defined in 191.5.2.8.

On P155L3 Change: This limit applies to all transmitted symbol sequences, including SEND_S, SEND_T, and SEND_N.

To: This limit applies to all transmitted symbol sequences other than SEND_S, including SEND_T, and SEND_N. The limits for SEND_S are defined in 191.5.2.8.

Editorial license to add PICS for new shalls.

CI 191	SC 191.5.2.8	P135	L21	# 68
Pandey, Sujan		Velinktech		
Comment Type	E	Comment Status	A	EZ
1001 is binary number but reads like decimal				
SuggestedRemedy				
1001'b				
Response	Response Status C			
ACCEPT IN PRINCIPLE.				
Change: 1001				
To: 0b1001				

CI 191	SC 191.5.2.8	P135	L21	# 16
Wienckowski, Natalie		IVN Solutions LLC; Ethernovia, Bosch		
Comment Type	E	Comment Status	D	EZ - pull
awkward wording				
SuggestedRemedy				
Change: The polarity of the DME symbols can be of either polarity and can vary between SEND_S pulses.				
To: The DME symbols can be of either polarity and can vary between SEND_S pulses.				
Proposed Response	Response Status W			
PROPOSED ACCEPT IN PRINCIPLE.				

Note from GZ - TFTD - proposed new wording is more unclear - does the polarity shift pulse-to-pulse, or even within a SEND_S? DME detection is polarity insensitive anyways. Maybe this should be a requirement on the receiver.

CI 191	SC 191.5.2.8	P135	L29	# 44
Zherebtsov, Aleksei		Infineon		
Comment Type	T	Comment Status	A	SEND_S
For link synchronization to be completed the Follower shall detect the Leader SEND_S pulses and the Leader then shall detect the Follower SEND_S pulses. The draft gives no lower bound on the SEND_S amplitude, and no guidance on the receive side. 191.5.2.8.1 defines send_s_sigdet as "A Boolean variable indicating whether sufficient SEND_S pulses were detected with proper spacing. The definition of sufficient pulses is implementation dependent." An implementer has nothing to design the SEND_S detector against. The levels in the proposed sentence come from the draft. The weakest partner a receiver can meet is a 2.5 Gb/s PHY_S. Table 191-16 sets its minimum transmit power to -4 dBm for -T1 and -7 dBm for -V1. The 2.5 Gb/s path is PAM2, so this is 0.40 V and 0.20 V peak-to-peak. Table 191-21 gives a higher floor, 0.45 V and 0.22 V. It applies to a PHY_D at 100 Mb/s only, so it is not the worst case. The worst case link segment takes 3.0 dB off the lower pair. This gives 0.28 V for -T1 and 0.14 V for -V1. The worst case attenuation was estimated to be 3.0 dB, rounding up to the integer number of dB. (The 1001 DME burst was sent through the limit line of Equation (191-17), which Figure 191-52 applies to both -T1 and -V1. The peak-to-peak attenuation was estimated by simulation to be 2.1 dB for a minimum phase channel. It was 2.7 dB when the magnitude only limit line channel model was used.)				

SuggestedRemedy

Insert the following sentence in 191.5.2.8 right before the sentence which begins "At the Leader, SEND_S signal is defined to be a periodic signal", and after the text which gives the amplitude of the transmitter. "Transmissions of SEND_S pulses at this level mean that the receiver during link synchronization should be capable of detecting pulses at its MDI with a peak-to-peak amplitude of 0.28 V or more for -T1, or 0.14 V or more for -V1."

Response	Response Status C
ACCEPT IN PRINCIPLE.	
Accommodated by #43.	

CI 191	SC 191.5.2.8	P135	L44	# 288
Lo, William		Axonne Inc.		
Comment Type	E	Comment Status	A	late - EZ
LEADER TX case incorrect				
SuggestedRemedy				
Change to Leader TX				
Response	Response Status C			
ACCEPT				

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CI 191 SC 191.5.2.8 P138 L35 # 289
 Lo, William Axonne Inc.
 Comment Type E Comment Status A late - EZ
 Block of text above SYNC_DISABLE wrong font
 SuggestedRemedy
 Fix font and remove underline.
 Response Response Status C
 ACCEPT.

CI 191 SC 191.5.2.8.1 P136 L4 # 129
 Muma, Scott Microchip
 Comment Type T Comment Status D variables
 Could not find a statement of how force_config gets a value. Presumably it comes from register 1.2100.14 but there is no linkage in the text and not obvious since the register bit is not named the same as the variable.
 SuggestedRemedy
 Link registers and variables similar to Table 97-11 or change the text first sentence of the description with editorial license to read: This variable is set based on the value of bit 1.2100.14 (see 45.2.1.214) and indicates whether the PHY operates as the Leader or Follower.
 Proposed Response Response Status W
 PROPOSED ACCEPT IN PRINCIPLE.
 Create section 191.5.2.6.a PHY control registers
 The PHY control registers are shown in Table 191-10a (new table after Table 191-10)
 See comment_129_a.jpg for table details.

CI 191 SC 191.5.2.8.1 P136 L31 # 17
 Wienckowski, Natalie IVN Solutions LLC; Ethernovia, Bosch
 Comment Type E Comment Status A EZ
 grammar
 SuggestedRemedy
 Capitalize "see" as it is the start of a sentence. Also on P136L34, P136L37, P137L20, and P130L10.
 Response Response Status C
 ACCEPT.

CI 191 SC 191.5.2.8.2 P136 L19 # 300
 Razavi, Alireza Eliyan
 Comment Type E Comment Status A late - Link Sync
 In 191.5.2.8.2, the timer is defined as "break_link_timer_[HSM]" with a cross-reference to 98.5.2,. Figure 191-38 uses the bare name break_link_timer / break_link_timer_done with no subscript,
 SuggestedRemedy
 change the definition in 191.5.2.8.2
 Response Response Status C
 ACCEPT IN PRINCIPLE.
 In Figure 191-38 Change: break_link_timer
 To: break_link_timer_[HSM]

CI 191 SC 191.5.2.8.2 P137 L24 # 59
 Zherebtsov, Aleksei Infineon
 Comment Type T Comment Status A EZ
 The definition of follower_delay_timer refers to Figure 191-36, which is the Link Synchronization signaling structure. The offset that this timer controls is shown in Figure 191-37, the Link Synchronization timing figure, and that is the figure the body of 191.5.2.8 cites for the Follower reply timing ("with timing as shown in Figure 191-37", page 135, line 29). The figures were renumbered in D2.1 and this reference appears to have been shifted by one figure.
 SuggestedRemedy
 In the definition of follower_delay_timer in 191.5.2.8.2, change "as shown in Figure 191-36" to "as shown in Figure 191-37".
 Response Response Status C
 ACCEPT.

CI 191 SC 191.5.2.8.4 P138 L3 # 18
 Wienckowski, Natalie IVN Solutions LLC; Ethernovia, Bosch
 Comment Type E Comment Status A EZ
 duplicate period
 SuggestedRemedy
 Remove duplicate period at end of sentence.
 Response Response Status C
 ACCEPT.

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CI 191 SC 191.5.2.8.4 P138 L3 # 167

Regev, Alon Keysight

Comment Type E Comment Status A EZ

Double period typo: "The PHY Link Synchronization state diagram is shown in Figure 191-38.."

SuggestedRemedy

Remove the extra period.

Response Response Status C

ACCEPT.

CI 191 SC 191.5.2.8.4 P138 L15 # 299

Razavi, Alireza Eliyan

Comment Type T Comment Status A late - Link Sync

In Figure 191-38, the SIGDET_WAIT exit to REPLY_PAUSE is qualified by "send_s_sigdet * single_send_s_detect". Per 191.5.2.8.1, send_s_sigdet = TRUE indicates sufficient SEND_S pulses were detected, and single_send_s_detect = TRUE indicates at least one SEND_S pulse was detected. Any reasonable definition of "sufficient" is >= 1 pulse, so send_s_sigdet = TRUE implies single_send_s_detect = TRUE, making the single_send_s_detect term redundant (it cannot be FALSE while send_s_sigdet is TRUE). The corresponding Leader transitions in LEADER_PAUSE use bare send_s_sigdet without this qualifier, so the two roles express the same "sufficient pulses detected" decision inconsistently.

SuggestedRemedy

Remove single_send_s_detect from the SIGDET_WAIT exit so it reads "send_s_sigdet" (matching the Leader side).

Response Response Status C

ACCEPT.

CI 191 SC 191.5.2.8.4 P138 L33 # 298

Razavi, Alireza Eliyan

Comment Type T Comment Status A late - Link Sync

In Figure 191-38, the global transition into SYNC_DISABLE includes a term asserted when force_phy_type equals none of the six defined values (2.5G+100M, 5G+100M, 10G+100M, 100M+2.5G, 100M+5G, 100M+10G). However, the only exit from SYNC_DISABLE is qualified solely by !mr_autoneg_enable; it does not require force_phy_type to be valid. Because the entry is a global (continuously evaluated) transition, a PHY configured with an unsupported force_phy_type while mr_autoneg_enable = FALSE will leave SYNC_DISABLE on !mr_autoneg_enable and be immediately returned by the global arc. The state machine can never reach TRANSMIT_DISABLE, so it is held in (or oscillates around) SYNC_DISABLE with no productive exit. Entry is gated on invalid configuration but exit is not gated on valid configuration - an asymmetry creating a reachability/liveness defect.

SuggestedRemedy

Gate the SYNC_DISABLE exit on a supported force_phy_type. Change the exit condition from "!mr_autoneg_enable" to "!mr_autoneg_enable * (force_phy_type = 2.5G+100M + force_phy_type = 5G+100M + force_phy_type = 10G+100M + force_phy_type = 100M+2.5G + force_phy_type = 100M+5G + force_phy_type = 100M+10G)".

Response Response Status C

ACCEPT IN PRINCIPLE.

Change exit of SYNC_DISABLE to UCT.

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CI 191 SC 191.5.2.8.4 P138 L41 # 302

Razavi, Alireza

Eliyan

Comment Type T Comment Status A late- Link Sync

In Figure 191-38, state LINK_GOOD_CHECK has two exit transitions that are not mutually exclusive: "link_status = OK" (to LINK_GOOD) and "fail_inhibit_timer_done + training_failure" (to connector A). If link_status becomes OK at the same evaluation in which fail_inhibit_timer_done becomes true (with training_failure = FALSE), both exit conditions are satisfied and no precedence is defined, making the next state ambiguous. This also contradicts the fail_inhibit_timer definition in 191.5.2.8.2, which states a link is considered failed "only if the fail_inhibit_timer has expired and the link has still not gone into the link_status = OK state" - i.e., timer expiry alone should not force the failure exit when the link is OK.

SuggestedRemedy

Qualify the failure exit so it cannot fire when the link is good. Change the LINK_GOOD_CHECK -> A transition from "fail_inhibit_timer_done + training_failure" to "(fail_inhibit_timer_done * link_status = FAIL) + training_failure". Since link_status is exhaustively OK or FAIL, this makes the two LINK_GOOD_CHECK exits mutually exclusive and aligns the diagram with the fail_inhibit_timer definition in 191.5.2.8.2.

Response Response Status C

ACCEPT.

CI 191 SC 191.6.2 P143 L50 # 261

Wang, Frank

Realtek Semiconductor Corp.

Comment Type E Comment Status A EZ - pull

"AC" should only be used when the acronym is the start of the sentence.

SuggestedRemedy

line 50: change "AC-coupled" to "ac-coupled".
line 51: change "AC-coupling" to "ac-coupling".

Response Response Status C

ACCEPT IN PRINCIPLE.

P143L50, P151L9, P269L21, and P308L6:
change "AC-coupled" to "ac coupled".

P143L51, P151L10, and P269L22:
Change: There may be various methods for AC-coupling in actual implementations.

To: There are various methods of ac coupling used in implementations.

Val to make changes in Clause 192.

CI 191 SC 191.6.2.4 P145 L39 # 290

Lo, William

Axonne Inc.

Comment Type T Comment Status A late - EZ - pull

Does testmode 2 using a free running clock make sense at all? At the high speed transmit rate the Follower high speed Transmitter should never output at a frequency that is +1/-20%. The only time this frequency variation is allowed is during linksync and outputting DME SEND_S pulses.

SuggestedRemedy

Propose we remove the text

Response Response Status C

ACCEPT IN PRINCIPLE.

Remove the following:

Page 145 lines 39-41

Page 152 lines 11-13

Replace Page 135 line 23: See 191.6.2.4 and 191.7.2.4 for details on bit timing tolerance.

With: During link synchronization, if PHY_S is a Follower, the DME symbol time of the SEND_S signal transmitted by the PHY_S shall be within the range 25.6/3ns +25%/-1%.

Add PICS for new shall being added.

CI 191 SC 191.6.3.1 P148 L25 # 139

Muma, Scott

Microchip

Comment Type E Comment Status A EZ

The subclause title says "differential" but also covers single-ended.

SuggestedRemedy

Change subclause heading to "Receiver input signals"

Response Response Status C

ACCEPT.

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CI 191 SC 191.7.2.7 P153 L31 # 262
Wang, Frank Realtek Semiconductor Corp.
Comment Type TR Comment Status A EZ-R
The value for f = 150 is missing.
SuggestedRemedy
Change "3 < f <150" to "3 < f <= 150".
Response Response Status C
ACCEPT.

CI 191 SC 191.9.1.1 P156 L38 # 263
Wang, Frank Realtek Semiconductor Corp.
Comment Type E Comment Status A EZ - pull
Since "Fmax" is a variable, it should be italic.
SuggestedRemedy
Change "Fmax" to "Fmax".
Grant Editorial license to implement this change for any other places.
Response Response Status C
ACCEPT IN PRINCIPLE.
Search the document for Fmax and change all instances to be in "italic".
Val to check Clause 192.

CI 191 SC 191.9.1.3 P157 L40 # 264
Wang, Frank Realtek Semiconductor Corp.
Comment Type TR Comment Status A EZ-R
The value for f = 4000 is missing.
SuggestedRemedy
Change "3000 <= f < 4000" to "3000 <= f <= 4000".
Response Response Status C
ACCEPT.

CI 191 SC 191.10.1.5 P159 L38 # 265
Wang, Frank Realtek Semiconductor Corp.
Comment Type TR Comment Status A EZ-R
The value for f = 4000 is missing.
SuggestedRemedy
Change "3000 <= f < 4000" to "3000 <= f <= 4000".
Response Response Status C
ACCEPT.

CI 191 SC 191.10.2.1 P161 L1 # 266
Wang, Frank Realtek Semiconductor Corp.
Comment Type E Comment Status A EZ
formatting
SuggestedRemedy
The variable "f" in Equation (191-21) should be italic (including the second "f" in line 6).
Do the same for Equation (191-22).
Response Response Status C
ACCEPT.

CI 191 SC 191.11.2.1 P162 L47 # 267
Wang, Frank Realtek Semiconductor Corp.
Comment Type TR Comment Status A EZ-R
The value for f = Fmax is missing.
SuggestedRemedy
Change "400 <= f < Fmax" to "400 <= f <= Fmax".
Response Response Status C
ACCEPT.

CI 191 SC 191.12.2.1 P164 L6 # 268
Wang, Frank Realtek Semiconductor Corp.
Comment Type TR Comment Status A EZ-R
The value for f = Fmax is missing.
SuggestedRemedy
Change "400 <= f < Fmax" to "400 <= f <= Fmax".
Response Response Status C
ACCEPT.

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CI 191 SC 191.12.3 P164 L49 # 51

Zherebtsov, Aleksei

Infineon

Comment Type T Comment Status D fault tolerance

The -V1 MDI fault tolerance subclause states "The single conductor of the MDI should withstand, without damage, high-voltage transient noises and ESD per application requirements". The statement is not normative, and "per application requirements" names neither a stress level nor a test method, so nothing can be verified and nothing can be claimed in a PICS. The corresponding -T1 subclause, 191.11.3 on page 163 line 29, defers normatively to 96.8.3.

SuggestedRemedy

Either delete the sentence, or replace it with a normative and testable requirement, for example "The single conductor of the MDI shall withstand, without damage, the transient and ESD stresses specified in 96.8.3."

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

TFTD - There was some discussion on D2.0. We elected not to remove the reference to 96.8.3 which has a "shall" for -T1. Should we add a "shall" for -V1?

CI 191 SC 191.14 P165 L43 # 77

Ran, Adeo

Cisco Systems

Comment Type TR Comment Status D delay

The delay constraints are defined here as end-to-end and have a normative requirement ("shall not exceed the limits shown in Table 191-24").

As already discussed, end-to-end delays result from combinations of components that are usually not provided by the same vendor. As a result, no single vendor can declare compliance - the normative requirement is from a combination of transmitter and receiver in two devices.

Having a normative requirement that cannot be committed to (and thus cannot be verified) means this requirement is moot and will likely be interpreted in different ways by vendors, which might lead to systems failing the combined requirements.

Note that the reason for having delay constraints is stated explicitly as "predictable operation of the MAC Control PAUSE operation". This actually means the roundtrip delay needs to be capped, rather than the 1-way delay (which may be different in each direction)

In other clauses, the delay constraints are usually stated as the sum of transmit and receive delays in one implementation. This kind of requirement makes sense because it can be verified by each vendor, and if it is met on both sides, then the rountrip delay (which is what this is all about) is capped at twice the limit.

I realize that for an asymmetric PHY it is less natural to define the sum of transmit and receive delay, and it may seem difficult to measure. But having a normative requirement does not mean it needs to be measured - this can be declared by a vendor as "complies by design". Also, the requirement can be verified by a partner with known delays (e.g. a special test equipment).

Annex 191A describes delay allocation between transmit and receive path in each speed, but is labeled as "Informative". But this is practically a recommendation, not "provided for information only", so "informative" is an incorrect label. A recommendation can and should be included in the normative clause.

SuggestedRemedy

Change the normative requirement to be the sum of transmit and receive delays in the same PHY. The requirement _shall_ be met regardless of whether the PHY has HS in the transmit or receive direction.

For the limit value, use half of the 100M delay (currently 5120 ns) plus half of the HS delay (rate dependent). Define the value only in ns because the bit time is different in each direction.

Annex 191A should be replaced by examples of alloaction of the delay in ns between the transmit and receive path of _one device_. This can be done separately for a device with HS on the receive and on the transmit path. The delays in each direction can be given in terms of bit times.

Alternatively, if the reason for delay constraints is not the roundtrip delay required for PAUSE operation, delete the first sentence of the paragraph and include the actual reason for delay allocation instead. It might be that delay allocation has no effect on interoperability - in that

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general

COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

SORT ORDER: Clause, Subclause, page, line

CI 191

SC 191.14

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case, make it a recommendation for each direction, not a normative requirement on the sum. Annex 191A can then be deleted.

Alternatively, remove both 191.14 and annex 191A, if the reason for having delay constraints can't be described.

Proposed Response *Response Status* **W**
PROPOSED ACCEPT IN PRINCIPLE.

Clause 191:
TFTD there has been significant discussion on this with no agreement to make a change during D2.0 comment resolution.

Clause 192:

Replace text and table on page 292 with:

The combined transmit and receive data delay for an implementation of the PHY in a given mode shall not exceed the limits shown in Table 192–27. Transmit data delay is estimated from the input of a specified unit of data at the XGMII to the presentation of the same unit of data by the PHY to the MDI. Receive data delay is estimated from the input of a specified unit of data at the MDI to the presentation of the same unit of data by the PHY to the XGMII. Following the recommendations of 90A.7 for repeating delay variation patterns, the maximum intrinsic delay value is allocated to the transmit PHY and the minimum intrinsic delay value is allocated to the received PHY. For this purpose, the specified unit of data is the byte of data on the XGMII interface that corresponds to the first byte of data at the start of a TDD burst payload.

NOTE—The physical medium interconnecting two PHYs introduces additional delay in a link.

Table 192–27—Combined PHY Delay constraints

Operating mode	Maximum delay (ns)
PHY_S	5 120
PHY_D	11 776

<i>Cl</i> 191	<i>SC</i> 191.14	<i>P</i> 165	<i>L</i> 43	<i>#</i> 304
Razavi, Alireza		Eliyan		
<i>Comment Type</i>	T	<i>Comment Status</i>	D	<i>late - delay</i>

191.14 places a normative limit (Table 191-24) only on the end-to-end HS_PATH and LS_PATH delays, each of which is defined across two PHYs (e.g., HS_PATH is measured from the PHY_S XGMII to the PHY_D XGMII). There is no normative limit on the individual transmit-portion (XGMII-to-MDI) or receive-portion (MDI-to-XGMII) delay of a single PHY; the allocation between TX and RX is provided only as informative guidance in Annex 191A. Two consequences follow: (1) an individual PHY cannot be tested for delay conformance in isolation, because the only normative limit spans a second, independently-designed PHY; and (2) two PHYs that each assume a different TX/RX allocation can, when paired, exceed the Table 191-24 total even though each PHY individually claims conformance. This undermines multi-vendor interoperability, which is the purpose of the standard. Optional delay reporting detects such a mismatch but does not prevent it, since two conforming-on-paper PHYs can still fail to interoperate.

SuggestedRemedy

Introduce a normative per-PHY delay allocation so that interoperability holds by construction. In Clause 191 (e.g., 191.14 / Table 191-24), specify normative maximum values for the individual transmit-portion and receive-portion delay of each PHY, for both HS_PATH and LS_PATH, chosen such that the sum of the TX and RX sub-limits does not exceed the corresponding Table 191-24 total. This guarantees that any conforming TX paired with any conforming RX meets the end-to-end limit. Retain Annex 191A as informative, illustrating the allocation and the TX_Delay/RX_Delay measurement method (Figure 191A-1). The specific split values should be agreed within the Task Force; the normative requirement is that per-PHY TX and RX sub-limits exist and sum to no more than the Table 191-24 total. Alternatively, add two columns to Table 191-24 (maximum TX delay and maximum RX delay per path) rather than prose sub-limits.

Proposed Response *Response Status* **W**
PROPOSED ACCEPT IN PRINCIPLE.

TFTD

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CI 191 SC 191.15.1 P167 L13 # 130

Muma, Scott

Microchip

Comment Type E Comment Status R PICS

There are several PICS items that use an undefined + symbol. Clause 21 does not define what this means, so it's not clear that PICS items should be written this way. Suggest splitting items using + up into multiple separate items so that compliance can be clear. A PHY implementation that is compliant to one of these items makes it ambiguous which one.

SuggestedRemedy

Split the following PICS items up into individual items for example if status is (2.5G+5G)*PHY_S:M there should be one item for 2.5G*PHY_S:M and a separate item for 5G*PHY_S:M.

PCT5 P170L17
PCT24 P171L41
PCR3 P172L11
PCR5 P172L18
TPG2 P172L39
TPG4 P172L47
PCF2 P178L45
PCF14 P179L30
TM6 P182L28
TM9 P182L36

Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

CI 191 SC 191.15.3 P168 L9 # 142

Muma, Scott

Microchip

Comment Type E Comment Status A PICS

Options are defined but never used in the PICS items status, other options are used but never defined.

SuggestedRemedy

INS-T and INS-V are defined but never used so delete. INS, V1, and T1 are used but never defined, please add with editorial license.

OAM_HS and OAM_LS are defined but never used, while OAM is used but never defined, please combine OAM_HS/OAM_LS to OAM definition with editorial license.

Lead and Follow are defined but never used so delete.

Response Response Status C

ACCEPT IN PRINCIPLE.

In 191.15.3:

Delete PICS item *INS-V, Replace PICS item *INS-T with:

*INS Installation/cabling 191.9, 191.10 Items marked with INS include installation practices and cabling specifications, and are not applicable to a PHY manufacturer. Status O Support Yes[] No[]

Delete PICS item *OAM_LS, Replace PICS item *OAM_HS with:

*OAM Support for optional PCS level operations, administration, and maintenance 191.3.7, 191.4.7 Status O Support Yes[] No[]

In 191.15.4.3.2:

Change Status of PICS items PMAT5 and PMAT6 to PHY_S*Lead:M, and PHY_D*Lead:M respectively.

Change Status of PICS items PMAT8 and PMAT9 to PHY_S*Follow:M, and PHY_D*Follow:M respectively.

Change Status of PICS item PMAT10 to Follow:M

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CI 191 SC 191.15.3 P168 L38 # 156

Muma, Scott

Microchip

Comment Type T Comment Status A PICS

The major options are written as independent options and lump together transmit and receive speeds in the same item. However, a single PHY type supports one and only one of many of the options. For example a given PHY may be either PHY_D or PHY_S so should use the O/<n> Status. Transmit speeds are another set of mutually exclusive items, receive speeds are another set of mutually exclusive items, though dependent on PHY_D/PHY_S. Media type/MDI is another set of "pick one" per PHY. The Lead/Follow options if used also are not arbitrarily independent optional items, they have some dependency on PHY_S/PHY_D in the text.

SuggestedRemedy

Work with the Clause 191/PICS experts to group items appropriately for all 12 distinct PHYs.

Response Response Status C

ACCEPT IN PRINCIPLE.

Insert new options *T1 and *V1 in 191.15.3 in alphanumeric order.

*T1 Single shielded balanced pair of conductors support Subclause 191.1 Status: O/1 Yes[] No[]

*V1 Single-ended coaxial cable support Subclause 191.1 Status: O/1 Yes[] No[]

Editorial license to align option naming with changes in the descriptive text in 191.1.

Explanation: The PHY type determines which PICS apply, and the phy type is uniquely represented by the options PHY_D and PHY_S (which gives directionality), and 2.5G, 5G, or 10G which gives the rate.

A given device may support multiple PHY types, and therefore get filled out as one PICS sheet (therefore the options are not exclusive). As a result, once the PHY type is known, the correct PICS can be picked from the options.

The exception, and the missing piece of the PHY type is T1/V1, which is used by (191.15.4.3.9, 191.15.4.4.5, 191.15.4.5, and 191.15.4.6) but not defined as an option, and it is exclusive - because there is one physical MDI, and one medium. The proposed remedy corrects that.

Application of Leader/Follower are handled in other PICS, including dependencies for PHY_D and PHY_S use - however, this seems clearer to be spelled out with the related requirements rather than up in the options dictionary.

CI 191 SC 191.15.4.1 P169 L10 # 125

Muma, Scott

Microchip

Comment Type T Comment Status A PICS

This item G1 has no corresponding "shall" in the text and is duplicate with item ANS1 which does have a corresponding "shall", so ANS1 seems preferable.

SuggestedRemedy

Delete duplicate item G1

Response Response Status C

ACCEPT.

CI 191 SC 191.15.4.1 P169 L13 # 127

Muma, Scott

Microchip

Comment Type T Comment Status A PICS

Item G2 doesn't have a corresponding "shall" statement in the text and there are likely other specific items that do cover this and correspond to a shall statement.

SuggestedRemedy

Consider deleting G2 in favor of other items, or add a "shall" statement to clause 191.1.3 that is referenced.

Response Response Status C

ACCEPT IN PRINCIPLE.

Accommodated by response to comment #126.

Comment #126 deletes G2 in favor of PICS PMAT11 and PMAT12.

CI 191 SC 191.15.4.1 P169 L16 # 123

Muma, Scott

Microchip

Comment Type T Comment Status A PICS

The Feature says "If Auto- Negotiation is not used...", but then the Status says the item is only Mandatory if optional AN is supported. I think this support is mandatory whether or not AN is supported since AN can be unsupported or supported and not used.

SuggestedRemedy

Change AN:M to M

Response Response Status C

ACCEPT IN PRINCIPLE.

Accommodated by comment #126, which deletes the text.

Editor's note - if this is not deleted, status should be changed to !AN:M.

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CI 191 SC 191.15.4.1 P169 L16 # 126

Muma, Scott Microchip

Comment Type T Comment Status A PICS

If item G3 is not actually conditional on autonegotiation it is likely a duplicate of G2 and can just be deleted instead of fixing it and G2 could be improved on.

SuggestedRemedy

Delete duplicate item G3 and merge any useful information into G2 Feature description with editorial license.

Response Response Status C

ACCEPT IN PRINCIPLE.

Delete Item G3.
Delete item G2.
Editorial license to delete this PICS section, depending on another comment to delete G1.
Explanation - There are no shalls for G2 and G3, and, in fact, the text of G2 is in direct conflict with a shall/may combination in the 3rd paragraph of 191.5.2.2 (P121 L27) represented by PICS PMAT11 and PMAT12.

CI 191 SC 191.15.4.1 P169 L16 # 124

Muma, Scott Microchip

Comment Type E Comment Status A EZ

Subclause reference is incorrectly 149.1.3

SuggestedRemedy

Change to 191.1.3

Response Response Status C

ACCEPT.

CI 191 SC 191.15.4.2.5 P174 L21 # 168

Regev, Alon Keysight

Comment Type T Comment Status A EZ

PCT_L4 states PCS Transmit "shall generate a sequence (Tn) defined in 191.3.4.1"; this is the HS_PATH training sequence. The LS_PATH body text (191.4.2.2) defines a different sequence, "(Sn) defined in 191.4.4".

SuggestedRemedy

Correct PCT_L4 to reference sequence (Sn) defined in 191.4.4.

Response Response Status C

ACCEPT.

CI 191 SC 191.15.4.2.6 P175 L40 # 131

Muma, Scott Microchip

Comment Type T Comment Status A EZ

PCRL4 and PCRL5 have PHY_D in the status column, but should be PHY_S.

SuggestedRemedy

Change PHY_D to PHY_S in 2 places.

Response Response Status C

ACCEPT.

CI 191 SC 191.15.4.2.6 P175 L40 # 48

Zherebtsov, Aleksei Infineon

Comment Type T Comment Status A PICS

The status of PICS item PCRL4 is PHY_D:M, but the requirement it references, 191.4.2.3.2, states on page 117 line 21 that "PHY_S shall employ the receiver descrambler generator polynomial", and the item sits in 191.15.4.2.6, "PCS, LS_RX", which is the receive side of the low speed path, that is the PHY_S. The status contradicts both the feature description of the item and the referenced requirement.

SuggestedRemedy

In 191.15.4.2.6 change the status of PCRL4 from "PHY_D:M" to "PHY_S:M", and review the status column of the other items of 191.15.4.2.6 for the same error.

Response Response Status C

ACCEPT IN PRINCIPLE.

Change Status from PHY_D:M to PHY_S:M for:

PCRL4 and PCRL5

CI 191 SC 191.15.4.2.7 P176 L6 # 169

Regev, Alon Keysight

Comment Type T Comment Status A EZ

TPGL1 references Figure 191-11 (HS_PATH TX bit-ordering figure) instead of Figure 191-22 (LS_PATH TX bit ordering). The next item, which should be "TPGL2", is mislabeled "TPG2" and references Figure 191-14 (HS_PATH RX bit ordering) instead of Figure 191-23 (LS_PATH RX bit ordering, per the 191.4.3).

SuggestedRemedy

Correct both figure references to 191-22 and 191-23, and relabel the second item "TPGL2" for naming consistency.

Response Response Status C

ACCEPT.

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CI 191 SC 191.15.4.3.2 P178 L3 # 132

Muma, Scott Microchip

Comment Type E Comment Status A PICS

Having 2 status possibilities for the same item seems strange, more clear to split into 2 separate items.

SuggestedRemedy

Split PMAT11 and PMAT12 into 2 separate items each, one per item per PHY.

Response Response Status C

ACCEPT IN PRINCIPLE.

PMAT11
Change Value/Comment to: PHY_D always supports Leader
Change Status to: PHY_D:M

add PMAT11a
Same as PMAT11 except:
Value/Comment: PHY_S optionally supports Leader
Status: PHY_S:O
Support: Yes [], No [], N/A []

PMAT12
Change Value/Comment to: PHY_S always supports Follower
Change Status to: PHY_S:M

add PMAT12a
Same as PMAT12 except:
Value/Comment: PHY_D optionally supports Follower
Status: PHY_D:O
Support: Yes [], No [], N/A []

CI 191 SC 191.15.4.3.4 P179 L9 # 133

Muma, Scott Microchip

Comment Type T Comment Status A PICS

HS_PATH items are not exclusive to PHY_S, so any HS_PATH receiver requirement should have a separate PHY_S PICS item.

SuggestedRemedy

Split PCF7, PCF4 into separate PHY_S (transmit) and PHY_D (receive) items. With editorial license split any other combined transmit/receive items into separate PICS.

Response Response Status C

ACCEPT IN PRINCIPLE.

PCF4
Change Value/Comment to: Set to zero on transmit.

add PCF4a
Same as PCF4 except:
Value/Comment: Ignored when received by the link partner.
Status: PHY_D:M

PCF7
Change Value/Comment to: Only values in Table 191–5 and Table 191–6 are transmitted.

add PCF7a
Same as PCF7 except:
Value/Comment: Any other value is ignored by the receiver.
Status: PHY_D:M

CI 191 SC 191.15.4.3.5 P180 L12 # 134

Muma, Scott Microchip

Comment Type E Comment Status A PICS

Many of the items in this table are labelled PHY_S but should be PHY_D

SuggestedRemedy

Change PHY_S to PHY_D in status column (6 items)

Response Response Status C

ACCEPT IN PRINCIPLE.

Change Status from PHY_S:M to PHY_D:M for:
PCFL3, PCFL4, PCFL5, PCFL6, and PCFL7.

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CI 191 SC 191.15.4.3.5 P180 L18 # 135

Muma, Scott Microchip

Comment Type T Comment Status A PICS

LS_PATH items impact both PHY_S and PHY_D so any LS_PATH receiver requirement should have a separate PHY_D PICS item.

SuggestedRemedy

Split PCFL5 into separate PHY_S and PHY_D items. With editorial license split any other combined transmit/receive items into separate PICS.

Response Response Status C

ACCEPT IN PRINCIPLE.

PCFL5

Change Value/Comment to: Only values in Table 191–5 and Table 191–6 are transmitted. Status changed by #134.

add PCFL5a

Same as PCFL5 except:

Value/Comment: Any other value is ignored by the receiver.

Status: PHY_S:M

CI 191 SC 191.15.4.3.6 P180 L43 # 136

Muma, Scott Microchip

Comment Type T Comment Status A PICS

PCFB2 appears to be 2 items in one. Split into PHY_S and PHY_D items.

SuggestedRemedy

With editorial license split PCFB2 into one item with status PHY_D:M and one item with PHY_S:M.

Response Response Status C

ACCEPT IN PRINCIPLE.

PCFB2

Change Value/Comment to: Complies with Table 191–9 for PHY_S Leader.

Change Status to: PHY_S*Lead:M

Change Support to: Yes [], N/A []

add PCFB3

Same as PCFB2 except:

Value/Comment: Complies with Table 191–10 for PHY_D as Leader.

Status: PHY_D*Lead:M

Support: Yes [], N/A []

CI 191 SC 191.15.4.3.8 P181 L6 # 137

Muma, Scott Microchip

Comment Type T Comment Status A EZ

The value comment makes it seem as if this is conditional on !AN, but the status makes it clear it's mandatory/unconditional.

SuggestedRemedy

Change Value/Comment for PLS1 to "Comply with Figure 191-38."

Response Response Status C

ACCEPT.

CI 191 SC 191.15.4.4.1 P182 L36 # 55

Zherebtsov, Aleksei Infineon

Comment Type E Comment Status A EZ

The Status column of PICS item TM9 begins "PPHY_S". PPHY_S is not a defined predicate; every other item of the proforma uses PHY_S or PHY_D.

SuggestedRemedy

Change "PPHY_S" to "PHY_S" in the Status column of TM9.

Response Response Status C

ACCEPT.

CI 191 SC 191.15.4.4.2 P182 L23 # 173

Regev, Alon Keysight

Comment Type E Comment Status A EZ

On both pages 182 and 185, PICS entries TM4 and PML4 (test mode 1 clock access) specify clock "TX_CLK_175" (missing "T"); text throughout 191.6/191.7 consistently uses "TX_TCLK_175".

SuggestedRemedy

Correct "TX_CLK_175" to "TX_TCLK_175" in both PICS items.

Response Response Status C

ACCEPT.

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CI 191 SC 191.15.4.4.2 P184 L9 # 52

Zherebtsov, Aleksei Infineon

Comment Type T Comment Status A EZ

PICS item TES19, "Transmitter quiet signal level", is wrong in two ways. It references 191.6.2.7, but the requirement it states is in 191.6.2.6, page 146 line 14: "When tx_symb is Z the transmit signal at the MDI is nominally zero, and the transmit signal shall be less than -36dBm"; 191.6.2.7 is the peak output subclause and says nothing about the quiet level. It also states the limit as "Less than -36 dB", where the body states -36 dBm. dB is a ratio and dBm is an absolute power, so the proforma as printed does not state a testable limit. The Clause 192 counterpart, PMAT11 on page 309 line 16, correctly reads -36 dBm.

SuggestedRemedy

In 191.15.4.4.2, change the Subclause of TES19 from "191.6.2.7" to "191.6.2.6" and its Value/Comment from "Less than -36 dB" to "Less than -36 dBm".

Response Response Status C

ACCEPT.

CI 191 SC 191.15.4.4.3 P184 L22 # 170

Regev, Alon Keysight

Comment Type T Comment Status A EZ

Two different PICS items ("Receiver differential input signals" and "Broadband noise rejection") are both labeled "RES1".

SuggestedRemedy

Relabel the second item "RES2".

Response Response Status C

ACCEPT.

CI 191 SC 191.15.4.4.3 P184 L23 # 138

Muma, Scott Microchip

Comment Type T Comment Status A EZ

The feature name for the first RES1 is just the subclause title, the feature seems to be receiver BER.

SuggestedRemedy

Change feature to Receiver post-FEC BER

Response Response Status C

ACCEPT.

CI 191 SC 191.15.4.4.3 P184 L25 # 140

Muma, Scott Microchip

Comment Type E Comment Status A EZ

This item should be RES2 as RES1 is already used.

SuggestedRemedy

Change RES1 to RES2

Response Response Status C

ACCEPT.

CI 191 SC 191.15.4.4.3 P184 L25 # 49

Zherebtsov, Aleksei Infineon

Comment Type T Comment Status A EZ

Item number RES1 is used for two different features inside one table: "Receiver differential input signals" referencing 191.6.3.1 at page 184 line 22, and "Broadband noise rejection" referencing 191.6.3.2 at page 184 line 25. PICS item numbers have to be unique for a completed proforma to be interpretable. The same defect occurs elsewhere in 191.15: TPG2 is used at page 172 line 39 and again at page 176 line 12, and the seven items LSCT1 to LSCT7 are used both in the -T1 link segment table, page 187 lines 6 to 21, and in the -V1 link segment table, page 187 lines 30 to 45, where they denote different features. For example LSCT3 is "Coupling attenuation" in the first table and "Screening attenuation" in the second.

SuggestedRemedy

Renumber the 191.15 proforma so that every item number is unique. Suggested: renumber the second RES1 to RES2 and shift the following items of that table; give the LS_PATH test pattern item at page 176 line 12 an item number distinct from TPG2; and renumber the -V1 link segment items LSCT1 to LSCT7 as LSCV1 to LSCV7.

Response Response Status C

ACCEPT.

CI 191 SC 191.15.4.4.5 P185 L33 # 171

Regev, Alon Keysight

Comment Type T Comment Status A EZ

TESL5 is titled "Follower peak-to-peak value of timing jitter at TX_TCLK" with value "Less than 10×J ps", but per the 191.7.2.1 body text this scaled value is the Leader's spec; the Follower's limits are fixed, non-scaled values (50 ps RMS, 500 ps p-p).

SuggestedRemedy

in TESL5 change "Follower" to "Leader"

Response Response Status C

ACCEPT.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general

COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

SORT ORDER: Clause, Subclause, page, line

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SC 191.15.4.4.5

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CI 191 SC 191.15.4.4.5 P185 L33 # 47

Zherebtsov, Aleksei Infineon

Comment Type T Comment Status A EZ

PICS item TESL5 assigns the limit "Less than 10 x J ps" to the Follower, but 191.7.2.1 assigns the 10 x J ps peak-to-peak limit to the Leader, on page 151 lines 24 and 25, and gives the Follower a separate peak-to-peak limit which is listed as TESL7. As the table stands there are two Follower peak-to-peak jitter items and no item at all for the Leader peak-to-peak jitter at TX_TCLK, so that requirement of 191.7.2.1 has no PICS entry.

SuggestedRemedy

In 191.15.4.4.5 change the Feature of TESL5 from "Follower peak-to-peak value of timing jitter at TX_TCLK." to "Leader peak-to-peak value of timing jitter at TX_TCLK."

Response Response Status C

ACCEPT.

CI 191 SC 191.15.4.4.5 P185 L38 # 172

Regev, Alon Keysight

Comment Type T Comment Status A EZ

TESL7 ("Follower peak-to-peak timing jitter at TX_TCLK") states the limit as "Less than 5000 ps". The 191.7.2.1 body text specifies this limit as 500 ps.

SuggestedRemedy

Correct "5000 ps" to "500 ps".

Response Response Status C

ACCEPT.

CI 191 SC 191.15.4.4.5 P185 L38 # 46

Zherebtsov, Aleksei Infineon

Comment Type T Comment Status A EZ

PICS item TESL7 requires the Follower peak-to-peak timing jitter at TX_TCLK to be "Less than 5000 ps", but 191.7.2.1, the subclause it references, requires on page 151 line 30 that "The peak-to-peak value of the Follower TX_TCLK_175 jitter relative to an unjittered reference shall be less than 500 ps". The proforma value is ten times the value in the body. TESL6, the Follower RMS item, agrees with the body at 50 ps, which indicates a typing error in TESL7 rather than an intended difference.

SuggestedRemedy

In 191.15.4.4.5 change the Value/Comment of TESL7 from "Less than 5000 ps." to "Less than 500 ps."

Response Response Status C

ACCEPT.

CI 191 SC 191.15.4.4.5 P186 L11 # 53

Zherebtsov, Aleksei Infineon

Comment Type T Comment Status A EZ

PICS item TESL17, "Transmitter quiet signal level", states the limit as "Less than -36 dB", while the requirement it references, 191.7.2.7, states -36 dBm. dB is a ratio and dBm is an absolute power, so the proforma as printed does not state a testable limit. This is the same defect as in TES19 on page 184.

SuggestedRemedy

In 191.15.4.4.5, change the Value/Comment of TESL17 from "Less than -36 dB" to "Less than -36 dBm".

Response Response Status C

ACCEPT.

CI 191 SC 191.15.4.4.6 P186 L27 # 141

Muma, Scott Microchip

Comment Type E Comment Status A EZ

Feature name is incorrect, the feature seems to be receiver BER.

SuggestedRemedy

Change feature to Receiver post-FEC BER

Response Response Status C

ACCEPT.

CI 191A SC 191A P320 L1 # 3

Turner, Max Ethernetovia

Comment Type TR Comment Status A EZ-R

It seems comment #135
Change: frame or superframe
To: superframe
was not implemented correctly
instead is was changed to frame

SuggestedRemedy

Change: frame
To: superframe

Response Response Status C

ACCEPT.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general

COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

SORT ORDER: Clause, Subclause, page, line

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CI 191A SC 191A P320 L31 # 78

Ran, Adeo

Cisco Systems

Comment Type TR Comment Status D delay

Annex 191A is defined as informative, but it contains recommendations, which are practically requirements, because if they are not met then delay constraints for PAUSE cannot be guaranteed.
Recommendations are not informative - they are normative (though not required).
This annex does not provide any information other than the recommended allocations (and even these are referred back to the normative clause 191) Therefore, its designation as informative is incorrect.

SuggestedRemedy

As suggested in another comment the normative requirement (or recommendation) should be the sum of Tx and Rx paths of the same PHY. If that is done, the annex can provide an example of how the sum can be divided between the Tx and Rx, with specific bit times and pause_quanta value for each path.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

TFTD if there is a desire to make a change.

CI 192 SC 192 P L # 5

Estrakh, Daniel

Valens Semiconductors

Comment Type TR Comment Status R consensus

Clause 191 and Clause 192 are two separate, non-interoperable PHY schemes for the same asymmetric automotive link application. This conflicts with the project's own basis: the CSD justifies the project on cost/power-constrained applications "requiring a targeted solution" (singular) - not two competing, mutually incompatible ones. Maintaining both schemes in the draft creates market fragmentation risk rather than adoption.

SuggestedRemedy

Select one of Clause 191 or Clause 192 as the standardized asymmetric automotive PHY scheme and remove the other from the draft.

Response Response Status C

REJECT.

There is no consensus within the CRG to make a change.

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

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

CI 192 SC 192 P190 L17 # 1

Lu, Chao

BMW Group

Comment Type T Comment Status D 1G

Add a 1Gb/s LS PHY option for use with Clause 192

SuggestedRemedy

The draft limits the low-speed (LS) direction to 100 Mb/s, while production automotive camera applications already exceed this limit in the LS direction. With editorial license, incorporate the changes proposed in chini_3dm_02a_D2d0_1G-comments-preview.pdf (June 2, 2026 ad hoc folder, <https://ieee802.org/3/dm/public/adhoc/060226>), i.e. add a 1 Gb/s LS PHY option for use with Clause 192, and adapt all affected clauses/subclauses as shown in that markup file.

Proposed Response Response Status W

PROPOSED REJECT.

TFTD. There was no consensus in the CRG to make this change. See P802.3dm d2p0 Comment #358 for Motion details.

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general

COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

SORT ORDER: Clause, Subclause, page, line

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SC 192

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CI **192** *SC* **192.1** *P***189** *L***10** # **103**

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

Comment Type **TR** *Comment Status* **D** *default config*

While each PHY may support multiple data rates, a single common set (a least-common denominator) must be required in order to have interoperability as a single PHY type. The objectives and the design suggest that this is 2.5G+100M with reversibility, as startup requires transmission and reception of SEND_TS which is 3GBd/PAM2 common to 100M low data rate and 2.5Gb/s high data rate modes (similarly, the 100Mbps low rate mode is a common factor, but startup requires both link partners to support transmission and reception). All other speeds and directionality can then be options selected during startup training.

SuggestedRemedy

Replace the first 2 sentences of 192.1 ("MultiGBASE-AT1 and MultiGBASE-AV1 PHYs use ... through... may support multiple data rates." with "MultiGBASE-AT1 and MultiGBASE-AV1 PHYs provide asymmetric transmission of multiple data rates, determined during startup. All MultiGBASE-AT1 and MultiGBASE-AV1 PHYs support at least 2.5Gb/s throughput in one direction and 100 Mb/s throughput in the opposite direction, with the ability to reverse directions at these data rates. Each PHY may support other optional data rates, and the ability to support reversing direction of rate asymmetry at rates other than 2.5 Gb/s and 100 Mb/s is optional. MultiGBASE-AT1 and MultiGBASE-AV1 PHYs use a time-division duplex (TDD) transmission structure between two active PHYs, in which one link partner transmits a burst while the other is silent."

At P190 L13 (Table 192-1), add a column to the right of the existing columns, labeled: "Optional/Mandatory", populating the rows with 100 Mb/s 2.5Gb/s (and 2.5Gb/s and 100 Mb/s) as Mandatory and all other rows with Optional. (editorial license to use M or O and add a footnote similar to Table 131-2 in IEEE Std 802.3-2022 if needed.)

At P202L32 (192.3.2 new 2nd paragraph), insert "The PCS shall support transmission and reception of 2.5 Gb/s and 100 Mb/s, and may support any combination of 5 Gb/s, 7.5 Gb/s, or 10 Gb/s in the high speed direction."

Add PICS - "PCS1", Feature "Rate support" Subclause 192.3.2 Value/Comment "Supports 2.5Gb/s and 100 Mb/s in both directions" Status M Support Yes[]
(editorial license - suggest new section before PCS Transmit for PCS - note, these might be major capabilities/options, but I couldn't see where they individually applied and PCS seemed more appropriate)
PCS2 5 Gb/s HS_TX Support 192.3.2 Value/Comment 5Gb/s HS Transmit Status O Support Yes[] No[]
PCS3 5 Gb/s HS_RS Support 192.3.2 Value/Comment 5Gb/s HS Receive Status O Support Yes[] No[]
PCS4 7.5 Gb/s HS_TX Support 192.3.2 Value/Comment 7.5Gb/s HS Transmit Status O Support Yes[] No[]
PCS5 7.5 Gb/s HS_RS Support 192.3.2 Value/Comment 7.5Gb/s HS Receive Status O Support Yes[] No[]
PCS6 10 Gb/s HS_TX Support 192.3.2 Value/Comment 10Gb/s HS Transmit Status O Support Yes[] No[]

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general

COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

SORT ORDER: Clause, Subclause, page, line

PCS7 10 Gb/s HS_RS Support 192.3.2 Value/Comment 10Gb/s HS Receive Status O Support Yes[] No[]

At P257L4 (192.4.2.4.5) Add new final sentence to paragraph after "...the negotiated rates.": "While speed and direction are negotiated during startup, the requirements on the PCS, startup signaling, and the PMA make support of 2.5 Gb/s and 100 Mb/s with reversibility a lowest common denominator for interoperable physical layer links."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.

Replace the first 2 sentences of 192.1 ("MultiGBASE-AT1 and MultiGBASE-AV1 PHYs use ... through... may support multiple data rates." with, "MultiGBASE-AT1 and MultiGBASE-AV1 PHYs provide asymmetric transmission of multiple data rates, which are determined during startup. All MultiGBASE-AT1 and MultiGBASE-AV1 PHYs support 2.5Gb/s transmit with 100 Mb/s receive and 2.5Gb/s receive with 100 Mb/s transmit. Each PHY may support other optional data rate combinations, and may support reversing direction of rate asymmetry at these other data rate combinations. MultiGBASE-AT1 and MultiGBASE-AV1 PHYs use a time-division duplex (TDD) transmission structure between two active PHYs, wherein one link partner transmits a burst while the other is silent."

At P190 L13 (Table 192-1):

Add a Support Required column to the right of table, noting all rows with 2.5 Gb/s as Mandatory and all other rows as Optional.

At P202L32 (192.3.2 new 2nd paragraph):

Insert, "The PCS shall support asymmetric operation using 2.5 Gb/s transmission with 100 Mb/s reception and 100 Mb/s transmission with 2.5 Gb/s reception. The PCS may optionally support 5 Gb/s, 7.5 Gb/s, or 10 Gb/s data rates in the high-speed direction."

Grant Editorial license to update PICS to reflect that both {2.5 Gb/s transmit and 100 Mb/s receive, 2.5 Gb/s receive and 100 Mb/s transmit} modes are mandatory, and all other rate/direction combinations are optional.

(Editor's note: Work with TDD champion to develop the PICS. It's anticipated that two of the rate combinations will be M and the rest O.)

At P257L4 (192.4.2.4.5):

Add new final sentence to paragraph after "...the negotiated rates", "Although rate and direction are negotiated during startup, the two rate combinations operating at 2.5 Gb/s in one direction and 100 Mb/s in the opposite direction shall be supported as the minimum baseline rate combination for link interoperability."

Add new second paragraph to 46.1.3, updating Editor's instructions as appropriate.

For proper operation, the XGMII implementation's supported rate combinations should match the rates of the connected PHY type in both directions. For Auto-Negotiated rates, PHYs with multiple rates, or where the direction of asymmetry may be reversed, proper

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SC **192.1**

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operation is not assured if the rates supported by the XGMII implementation do not match those of the PHY.

CI 192 SC 192.1 P189 L33 # 19

Wienckowski, Natalie IVN Solutions LLC; Ethernovia, Bosch

Comment Type E Comment Status A EZ

"simultaneous" does not provide any value. There is no reason to include multiple PHYs in a single device if they can't be used simultaneously.

SuggestedRemedy

Change: A device that supports multiple simultaneous MultiGBASE-A PHYs

To: A device that supports multiple MultiGBASE-A PHYs

Response Response Status C

ACCEPT.

CI 192 SC 192.1.1 P190 L7 # 174

Regev, Alon Keysight

Comment Type T Comment Status A EZ

Text states "The six modes of operation and MAC data rate combinations for each of the two PHY types are shown in Table 192-1", but Table 192-1 actually shows 8 mode/rate combinations per PHY type (16 rows total across both PHY types).

SuggestedRemedy

Change "six" to "eight", or remove the specific count from the sentence.

Response Response Status C

ACCEPT IN PRINCIPLE.

Replace, "The six modes"

with, "The modes"

CI 192 SC 192.1.1 P190 L7 # 105

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

Comment Type TR Comment Status A EZ-R

The clause speaks repeatedly of "MAC data rate" -there isn't a "MAC data rate". There is a data rate supported by the physical layer to or from the MAC, or more particularly from the RS.

SuggestedRemedy

Replace "MAC data rate" with "Data rate" globally in clause 192, wherever it is used generally (P190 L7,

Replace "Transmit MAC data rate" with "Transmit data rate", and Receive MAC data rate with "Receive data rate" globally in clause 192.

Response Response Status C

ACCEPT.

CI 192 SC 192.1.1 P190 L8 # 20

Wienckowski, Natalie IVN Solutions LLC; Ethernovia, Bosch

Comment Type T Comment Status A EZ

With the addition of 7.5 Gb/s there are 8 modes of operation.

SuggestedRemedy

Change: The six modes of operation

To: The eight modes of operation

Response Response Status C

ACCEPT IN PRINCIPLE.

Accomodated by Comment #174.

CI 192 SC 192.1.2 P191 L25 # 21

Wienckowski, Natalie IVN Solutions LLC; Ethernovia, Bosch

Comment Type E Comment Status A EZ

The Figure is overlapping the text.

SuggestedRemedy

Add white space at the top of the figure so "OSI" doesn't overlap "Clause", or use some other method to fix the overlap.

Response Response Status C

ACCEPT IN PRINCIPLE.

Add white space at the top of the figure so "OSI" doesn't overlap "Clause"

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CI **192** *SC* **192.1.3** *P***192** *L***52** # **306**
 Maguire, Valerie Copperopolis; affl w/ CME Consulting, Microchip, and
Comment Type **E** *Comment Status* **A** *late -EZ*

Correct E-Z typos and grammar issues

SuggestedRemedy

P192, L51 and P251, L42:
 Replace, "back the PMA TRANSMIT"with "back to the PMA TRANSMIT"

P195, L42:
 Replace, "The MDI for a" with "The MDIs for a"

P204, L35:
 Replace, "are preceded" with " is preceded"

P208, L31:
 Replace, "shown in shown in" with "shown in"

P245, L6:
 Replace, "proceed to load in the next" with "proceed to load the next"

P246, L9 and P247, L21:
 Replace, "whether MultiGBASE-A OAM message" with "whether the MultiGBASE-A OAM message"

P247, L4:
 Replace, "whether valid MultiGBASE-A OAM" with "whether a valid MultiGBASE-A OAM"

P247, L21:
 Replace, "in previous MultiGBASE-A OAM frame" with "in the previous MultiGBASE-A OAM frame"

P248, L5:
 Replace, "begin transmitting them" with "begin transmitting it"

P254, L28:
 Replace, "rollover to zero" with "roll over to zero"

P257, L2:
 Replace, "either management configuration " with "either the management configuration "

P257, L2:
 Replace, "or selecting the highest mutually" with "or selection of the highest mutually"

P263, L32:
 Replace, "currently in either in a silent mode" with "currently in either a silent mode"

P299, L18:

Replace, "one OAM symbols is" with "one OAM symbol is"
Response *Response Status* **C**
 ACCEPT.

CI **192** *SC* **192.2.1.2.1** *P***198** *L***44** # **307**
 Muma, Scott Microchip
Comment Type **T** *Comment Status* **A** *late - PMA*
 2.5 Gb/s or 5 Gb/s transmit payload

SuggestedRemedy

Change "2.5 Gb/s or 5 Gb/s transmit payload" to "100 Mb/s, 2.5 Gb/s, or 5 Gb/s transmit payload"

Response *Response Status* **C**
 ACCEPT.

CI **192** *SC* **192.3.2.2** *P***211** *L***28** # **32**
 Gorshe, Steve Microchip
Comment Type **E** *Comment Status* **A** *ordered set*

There is a significant amount of redundancy between subclauses 192.3.2.2.6 and 192.3.2.2.10 regarding Ordered sets, with nearly half the text being duplicated or saying the same thing in different words. It is inconvenient to the reader to require using two separate subclauses for the complete set of information. While breaking the Ordered set information into two subclauses in 192.3.2.2 is consistent with Clause 149, it would be cleanest to follow the approach in the similar Clause 82.2.3.9 and merge 192.3.2.2.6 and 192.3.2.2.10 into a single subclause. Note that the same situation exists in 191.3.2.2 and hence I recommend making the same change there.

SuggestedRemedy

Delete subclause 192.3.2.2.6 and, with editorial license, change the text of the first paragraph of 192.3.2.2.10 to be: "Ordered sets are used to extend the ability to send control and status information over the link such as remote fault and local fault status. Ordered sets consist of a control character followed by three data characters on the XGMII. The ordered set control characters (/O/) indicate the start of an ordered set. There are two kinds of ordered sets: the sequence ordered set (see 46.3.4), which is the only type used in this clause, and the signal ordered set, which is reserved. When it is necessary to designate the control character for the sequence ordered set specifically, /Q/ is used. /O/ is only valid on the first octet of the XGMII. Receipt of an /O/ on any other octet of TXD indicates an error. Block type field values implicitly encode an /O/ as the first or fifth character of the block. The 4-bit O code encodes the specific /O/ character for the ordered set. See Table 192-3 for the mappings."

Response *Response Status* **C**
 ACCEPT.

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CI 192 SC 192.3.2.2.4 P209 L35 # 31

Gorshe, Steve

Microchip

Comment Type E Comment Status A EZ

Insert the text from Clause 149.3.2.2.4 that appears to have been accidentally omitted or removed here.

SuggestedRemedy

Below Figure 192-7, insert the two paragraphs below Figure 149-8: "Bits and field positions are shown . are reserved."

Response Response Status C

ACCEPT.

CI 192 SC 192.3.2.2.6 P210 L47 # 6

Maguire, Valerie

Copperopolis; affl w/ CME Consulting, Microchip, and

Comment Type E Comment Status A EZ - pull - ordered set

As written, the phrase "such as Remote Fault and Local Fault status" accidentally modifies the word link, instead of the control and status information.

SuggestedRemedy

Replace, "Ordered sets are used to extend the ability to send control and status information over the link such as Remote Fault and Local Fault status."

with, "Ordered sets are used to extend the ability to send control and status information, such as Remote Fault and Local Fault status, over the link."

Response Response Status C

ACCEPT IN PRINCIPLE.

Grant Editorial License to implement after Comment #32 is implemented.

CI 192 SC 192.3.2.2.15 P213 L10 # 69

Ran, Adeel

Cisco Systems

Comment Type E Comment Status A Editorial

In the subscript of m, the spaces around the multiplication signs (e.g. "122 <space>\times<space> L-1") are somewhat misleading, since the separation creates a visual hint that the minus sign is evaluated first (which is false). it would be better to have space around the minus sign instead, e.g. "122 \times L<space>-<space>1". Alternatively, do not use spaces at all. There are many such labels in figure 192-8, and some additional ones in figure 191-12, figure 191-14, figure 191-15. Also in text expressions in 192.3.2.2.14, 192.3.2.2.15, and possibly elsewhere.

SuggestedRemedy

In the subscripts of m, delete spaces around the multiplication signs and add spaces around the minus signs.

Implement in figure 192-8 and in text expressions in 192.3.2.2.14 and 192.3.2.2.15.

Consider changing other expressions that have mutliplication and plus or minus sign.

Response Response Status C

ACCEPT IN PRINCIPLE.

Grant Editorial license to change spacing following this guidance:

In the subscripts of m, delete spaces around the multiplication signs and add parenthesis around the items to be multiplied.

Implement in figure 192-8 and in text expressions in 192.3.2.2.14 and 192.3.2.2.15.

CI 192 SC 192.3.2.2.15 P213 L24 # 70

Ran, Adeo

Cisco Systems

Comment Type E Comment Status A Editorial

The long label below "Output encoded symbols" is redundant since the text above the figure already says that this is the output.

To reduce clutter in the figure, this label can be removed. The label below "Input message symbols" can also be moved to the text above the figure. The transmission order can be denoted in the text.

SuggestedRemedy

Add text above the figure defining the input symbols, similar to the definition of the output symbols, and add "The symbol $m_{(122 \times L - 1)}$ is the first symbol transmitted".

Delete the labels and the "first in/out" arrows from the figure.

Response Response Status C

ACCEPT IN PRINCIPLE.

Editor to work with TDD champion to add text above the figure defining the input symbols, similar to the definition of the output symbols, and add "The symbol $m_{(122 \times L - 1)}$ is the first symbol transmitted".

Delete the labels and the "first in/out" arrows from the figure.

CI 192 SC 192.3.2.2.16 P214 L10 # 175

Regev, Alon

Keysight

Comment Type T Comment Status A EZ

The LS_TX equation's range statement reads "for $i = 0$ to 123 , and $i = 0$ to 7 " - the second range variable should be j (which indexes bit position within the symbol), not a repeated i .

SuggestedRemedy

Change the second range variable to " $j = 0$ to 7 ".

Response Response Status C

ACCEPT.

CI 192 SC 192.3.2.2.16 P214 L18 # 176

Regev, Alon

Keysight

Comment Type T Comment Status A EZ

The HS_TX equation reads " $m_{i,j} = tx_RSmessage_{((121-i) \times 8 + i)}$, for $i = 0$ to 121 , and $i = 0$ to 7 ". The formula should add " $+ j$ ", not " $+ i$ ", and the range statement also repeats i instead of stating $j = 0$ to 7 .

SuggestedRemedy

Correct the formula to " $m_{i,j} = tx_RSmessage_{((121-i) \times 8 + j)}$, for $i = 0$ to 121 , and $j = 0$ to 7 ".

Response Response Status C

ACCEPT.

CI 192 SC 192.3.2.2.17 P216 L8 # 153

Muma, Scott

Microchip

Comment Type T Comment Status A scrambler

The scrambled refresh header bit sequence is more complex than necessary given other previous changes. The scrambled refresh header bit is always just the scrambler output bit XOR with the refresh_header(n) bit in both SEND_N and !SEND_N modes. Equation (192-4) can be updated accordingly and a note added below the equation to reference refresh_header(n) definition and Figures 192-5/192-6 updated.

SuggestedRemedy

1. Update Equation (192-4) to $C_n = \{DS_{n \leq N} \oplus refresh_header(n)\}$ XOR refresh_header(n)

$0 \leq n \leq N - 1$ (192-4)

2. At line 15 insert "refresh_header(n) is the refresh header bit sequence as defined in 192.3.4.2"

3. Change "TFn/Dn[0]" output of the refresh header generator in Figures 192-5 and 192-6 to "refresh_header(n)"

With editorial license for figure, cross reference, and any PICS updates

Response Response Status C

ACCEPT.

CI 192 SC 192.3.2.2.17 P216 L17 # 119

Muma, Scott

Microchip

Comment Type T Comment Status A PAM

Equation (192-5) is not right for PAM3 since it indexes both bits and symbols with "n". A different equation is required to relate the bits to symbols for PAM3.

SuggestedRemedy

Insert new equation (192-6) to give the PAM3 method of generating A_n as:

$A_n = \{DS_n[0] \oplus D_n[0] \text{ tx_mode} = \text{SEND_N} \text{ Nr} \leq n \leq \text{Nr} + 3/2 \times N_p - 1 \text{ (where } n \text{ is the bit index)} \}$ (192-6)

Update P216L17 to read "and PAM3 are shown in Equation (192-5) and Equation (192-6) respectively."

Response Response Status C

ACCEPT IN PRINCIPLE.

Insert new equation (192-5a) to give the PAM3 method of generating A_n as shown in: https://www.ieee802.org/3/dm/public/0926/equation_192_5a.pdf

Update P216L17 to read "are shown in Equation (192-5) for PAM2 and Equation (192-5a) for PAM3."

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CI 192 SC 192.3.2.2.18 P217 L24 # 111

Muma, Scott Microchip

Comment Type E Comment Status A EZ

The letter "T" in the boxes is understood to be a unit time delay, but the T symbol is used elsewhere in the clause and so should be defined.

SuggestedRemedy

Add a note to the figure "T represents 1 symbol period delay"

Response Response Status C

ACCEPT IN PRINCIPLE.

Insert note below figure,

"NOTE - T represents one symbol period delay.

CI 192 SC 192.3.2.2.19 P217 L28 # 121

Muma, Scott Microchip

Comment Type E Comment Status A EZ

The "management parameter config" would be more clear if it's specified and linked to the management registers responsible and this should be done throughout the text. The value of the management parameter config comes from register bit 1.2100.14 and so it would be more clear if it's mr_config and used consistently through the clause.

SuggestedRemedy

Replace "management parameter config" or "the management parameter config" with "mr_config":
P217L28, P217L35, P252L28, P252L30, P259L51, P260L50, P300L22, P300L32.

Change config to mr_config P261L36, P264L21-22.

On first use of mr_config P217L28 add (see 192.4.4.1 for definition of mr_config).

With editorial license.

Response Response Status C

ACCEPT.

CI 192 SC 192.3.2.2.19 P217 L43 # 118

Muma, Scott Microchip

Comment Type T Comment Status A PAM

In 7.5 Gb/s operation the scrambler advances for each payload bit, not for each ternary symbol, or it could advance 3 bits for each 2 ternary symbols.

SuggestedRemedy

Change: At each symbol period

To: At each PAM2 or PAM4 symbol period

And insert a sentence after: For PAM3 symbols the shift register advances once per payload bit, generating three new scrambler output bits for every two PAM3 symbol periods.

Response Response Status C

ACCEPT IN PRINCIPLE.

Change: At each symbol period, the shift register is advanced by one bit, and one new bit represented by Scrn[0] is generated.

To: At each PAM2 or PAM4 symbol period, the shift register is advanced by one bit, and one new bit represented by Scrn[0] is generated. For PAM3 symbols, the shift register advances once per payload bit and generates three new scrambler output bits for every two PAM3 symbol periods.

CI 192 SC 192.3.2.2.19 P218 L23 # 112

Muma, Scott Microchip

Comment Type E Comment Status A EZ

The letter "T" in the boxes is understood to be a unit time delay, but the T symbol is used elsewhere in the clause and so should be defined.

SuggestedRemedy

Add a note to the figure "T represents 1 symbol period delay"

Response Response Status C

ACCEPT IN PRINCIPLE.

Insert note below figure,

"NOTE - T represents one symbol period delay.

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CI 192 SC 192.3.2.2.23 P219 L44 # 191

Regev, Alon Keysight

Comment Type E Comment Status A PAM

Unlike the adjacent PAM3 (192.3.2.2.22) and PAM4 (192.3.2.2.20/.21) subclauses, which use normative "shall" language, 192.3.2.2.23 uses only descriptive wording ("the PCS Transmit process sends out PAM2 symbols according to the following mapping"). This is self-consistent with the absence of a PICS item for PAM2 mapping (unlike PAM3/PAM4, which have PICS items PCST23-PCST26), but the drafting style is inconsistent across the three sibling subclauses.

SuggestedRemedy

Normalize to "shall" language for consistency with the sibling PAM3/PAM4 subclauses, and add a corresponding PICS item if appropriate.

Response Response Status C

ACCEPT IN PRINCIPLE.

Change: PCS Transmit process sends out PAM2 symbols

To: PCS Transmit process shall send PAM2 symbols

Editorial license to add PICS.

CI 192 SC 192.3.4 P224 L51 # 154

Muma, Scott Microchip

Comment Type T Comment Status A EZ

TFn is intended to be the training frame bit sequence (See paragraph starting at P229L24). So also call it training frame here when defining TFn for consistency.

SuggestedRemedy

P224L51 change "training data" to "training frame bit"

Response Response Status C

ACCEPT.

CI 192 SC 192.3.4 P227 L35 # 33

Gorshe, Steve Microchip

Comment Type E Comment Status A EZ

Update the FEC terminology in Figure 192-20

SuggestedRemedy

For both the HS and LS burst structures, replace "RS" with "RS-FEC"

Response Response Status C

ACCEPT.

CI 192 SC 192.3.5.1.1 P231 L11 # 269

Wang, Frank Realtek Semiconductor Corp.

Comment Type TR Comment Status A EZ-R

IBLOCK_R and IBLOCK_T are not used due to no EEE mode

SuggestedRemedy

Remove lines 11 to 15.

Response Response Status C

ACCEPT IN PRINCIPLE.

(Editor's note: UBLOCK_R<71:0> is also not used.)

Delete lines 11 to 15 (IBLOCK_R<71:0> and IBLOCK_T<64:0>) and lines 27 to 29 (UBLOCK_R<71:0>) on page 231.

Delete lines 50 to 52 (UBLOCK_R<71:0>) on page 99.

CI 192 SC 192.3.5.1.3 P232 L37 # 270

Wang, Frank Realtek Semiconductor Corp.

Comment Type E Comment Status A EZ

To align with the description in the previous similar clauses, consider adding a sentence at the beginning.

SuggestedRemedy

Add a sentence before "Every case of the vector belongs to only one type.": This function classifies each 65-bit rx_coded vector as belonging to one of the five types {C, S, T, D, E} depending on its contents.

Response Response Status C

ACCEPT.

CI 192 SC 192.3.5.1.3 P232 L38 # 271

Wang, Frank Realtek Semiconductor Corp.

Comment Type E Comment Status A EZ - pull

formatting: apply "Justify", not "Align Left".

SuggestedRemedy

For R_BLOCK_TYPE, apply "Justify" to lines 38 ~ 52.

Response Response Status C

ACCEPT IN PRINCIPLE.

(Editor's note: Justify is not used when defining the parameter values.)

Justify sentence on P232, L51-52

TYPE: TR/technical required ER/editorial required GR/general required T/technical E/editorial G/general

COMMENT STATUS: D/dispatched A/accepted R/rejected RESPONSE STATUS: O/open W/written C/closed U/unsatisfied Z/withdrawn

SORT ORDER: Clause, Subclause, page, line

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CI 192 SC 192.3.5.1.3 P232 L39 # 272
Wang, Frank Realtek Semiconductor Corp.
Comment Type TR Comment Status A EZ-R
There are "eight" valid control characters, i.e., c0 ~ c7.
SuggestedRemedy
Change "seven" to "eight"
Response Response Status C
ACCEPT.

CI 192 SC 192.3.5.1.3 P232 L48 # 273
Wang, Frank Realtek Semiconductor Corp.
Comment Type E Comment Status A EZ - pull
improve readability: 2 additional commas.
SuggestedRemedy
Change "0xE1 or 0xFF and all control characters are valid." to "0xE1, or 0xFF, and all control characters are valid."
Response Response Status C
ACCEPT IN PRINCIPLE.
Use semicolons to separate the comma separated list from the other items.
Change: The vector contains a data/ctrl header of 1, a block type field of 0x87, 0x99, 0xAA, 0xB4, 0xCC, 0xD2, 0xE1 or 0xFF and all control characters are valid.
To: The vector contains a data/ctrl header of 1; a block type field of 0x87, 0x99, 0xAA, 0xB4, 0xCC, 0xD2, 0xE1, or 0xFF; and all control characters are valid.

CI 192 SC 192.3.5.1.3 P233 L9 # 274
Wang, Frank Realtek Semiconductor Corp.
Comment Type E Comment Status A EZ
To align with the description in the previous similar clauses, consider adding a sentence at the beginning.
SuggestedRemedy
Add a sentence before "Every case of the vector belongs to only one type.": This function classifies each 72-bit tx_raw vector as belonging to one of the five types {C, S, T, D, E} depending on its contents.
Response Response Status C
ACCEPT.

CI 192 SC 192.3.5.1.3 P233 L10 # 275
Wang, Frank Realtek Semiconductor Corp.
Comment Type E Comment Status R EZ
formatting: apply "Justify", not "Align Left".
SuggestedRemedy
For T_BLOCK_TYPE, apply "Justify" to lines 10 ~ 21.
Response Response Status C
REJECT.
Justify is not used when defining the parameter values.

CI 192 SC 192.3.5.1.3 P233 L11 # 276
Wang, Frank Realtek Semiconductor Corp.
Comment Type E Comment Status A EZ
"and" is missing.
SuggestedRemedy
Change "/T/, /E/;" to "/T/, and /E/;".
Response Response Status C
ACCEPT.

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CI 192 SC 192.3.5.1.3 P233 L14 # 277

Wang, Frank Realtek Semiconductor Corp.

Comment Type E Comment Status A EZ - pull

improve readability: 2 additional commas and use /S/ for consistent.

SuggestedRemedy

Change: Any characters before the S character are valid control characters other than /O/, /S/ and /T/ or form a valid ordered set, and all characters following the /S/ are data characters.

To: Any characters before the /S/ are either valid control characters other than /O/, /S/, and /T/, or form a valid ordered set, and all characters following the /S/ are data characters.

Response Response Status C

ACCEPT IN PRINCIPLE.

Replace,
"Any characters before the S character are valid control characters other than /O/, /S/ and /T/ or form a valid ordered set, and all characters following the /S/ are data characters."

with,

"All characters following the /S/ are data characters. When the vector contains /S/ in its fifth character, the first four characters are valid control characters except

- a) /S/ and /T/ cannot be one of the first four characters;
- b) /O/ can only be one of the first four characters if it's part of a valid ordered set.

CI 192 SC 192.3.5.1.3 P233 L19 # 278

Wang, Frank Realtek Semiconductor Corp.

Comment Type E Comment Status A EZ - pull

comma is missing.

SuggestedRemedy

Change "/S/ and /T/." to "/S/, and /T/."

Response Response Status C

ACCEPT IN PRINCIPLE.

Replace,
"The vector contains a /T/ in one of its characters, all characters before the /T/ are data characters, and all characters following the /T/ are valid control characters other than /O/, /S/ and /T/."

with,

"The vector contains a /T/ in one of its characters. All characters before the /T/ are data characters. Any characters following the /T/ are valid control characters, except for /O/, /S/, and /T/."

CI 192 SC 192.3.7 P238 L42 # 22

Wienckowski, Natalie IVN Solutions LLC; Ethernova, Bosch

Comment Type E Comment Status A EZ

typo

SuggestedRemedy

Change: such PHY link health status exchange

To: such as PHY link health status exchange

Response Response Status C

ACCEPT.

CI 192 SC 192.3.7.3 P243 L49 # 177

Regev, Alon Keysight

Comment Type E Comment Status A EZ

Text reads "Assignments for PCS register/bit numbers 3.2308 to 3.231 are shown in Table 45-233"; the ending register number "3.231" is truncated (it should be 3.2324 per table 45-233).

SuggestedRemedy

change "3.231" to "3.2324"

Response Response Status C

ACCEPT IN PRINCIPLE.

(Editor's note: 3.2321 addresses OAM registers.)

Replace, "...bit numbers 3.2308 to 3.231."

with, "...bit numbers 3.2308 to 3.2321 for OAM use."

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CI 192 SC 192.4.2.3 P253 L16 # 155

Muma, Scott Microchip
 Comment Type T Comment Status A Editorial

Receiver detection and correction of signal inversion seems like it is required.

SuggestedRemedy

Change "The receiver uses" to "The receiver shall use"
 Add corresponding PICS item with editorial license.
 Consider similar wording for Clause 191 P122L40.

Response Response Status C

ACCEPT IN PRINCIPLE.

In Clause 192:
 Change "The receiver uses" to "The receiver shall use"

Add corresponding PICS item with editorial license.

No change to be made to Clause 191.

CI 192 SC 192.4.2.4.3 P254 L25 # 178

Regev, Alon Keysight
 Comment Type E Comment Status A EZ

Text reads "The PHY burst count consists of 3 octets [Oct4<7:0>,Oct5<7:0>,Oct6,7:0>]" -
 missing the opening angle bracket for Oct6.

SuggestedRemedy

Correct "Oct6,7:0>" to "Oct6<7:0>".

Response Response Status C

ACCEPT.

CI 192 SC 192.4.2.4.3 P254 L28 # 23

Wienckowski, Natalie IVN Solutions LLC; Ethernovia, Bosch
 Comment Type E Comment Status A Editorial

awkward wording

SuggestedRemedy

Change: BC24 could roll over in the case the Leader has started long before the Follower
 sends the first responding burst.
 To: In the case where the Leader starts long before the Follower sends the first responding
 burst, BC24 could roll over.

Response Response Status C

ACCEPT IN PRINCIPLE.

Delete, "BC24 could roll over in the case the Leader has started long before the Follower
 sends the first responding burst."

CI 192 SC 192.4.2.4.5 P256 L35 # 24

Wienckowski, Natalie IVN Solutions LLC; Ethernovia, Bosch
 Comment Type E Comment Status A EZ

awkward wording

SuggestedRemedy

Change: A one in a field bit indicates
 To: A one in a bit field indicates

Response Response Status C

ACCEPT IN PRINCIPLE.

Change: A one in a field bit indicates

To: A one in a capability bit indicates

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CI 192 SC 192.4.2.4.5 P256 L38 # 25

Wienckowski, Natalie IVN Solutions LLC; Ethernovia, Bosch

Comment Type T Comment Status A EZ

Zero is used to represent one bit, not 6 bits.

SuggestedRemedy

Change: it would set Oct10<7:2> to zero.

To: it would set Oct10<7:2> to 000000.

Response Response Status C

ACCEPT IN PRINCIPLE.

Change: it would set Oct10<7:2> to zero.

To: it would set Oct10<7:2> to all zeros

CI 192 SC 192.4.2.4.5 P257 L33 # 116

Muma, Scott Microchip

Comment Type T Comment Status A EZ

Should specify the register bit location of the OAMen capability bits.

SuggestedRemedy

Insert: The advertised OAMen ability is in bit 1.2311.1. (See 45.2.1.244.5 for the definition of bit 1.2311.1.) The link partner's advertised OAMen is available in bit 1.2312.1. (See 45.2.1.245.4 for the definition of bit 1.2312.1.)

Response Response Status C

ACCEPT IN PRINCIPLE.

Insert: The advertised OAMen ability is in bit 1.2311.1 (see 45.2.1.244.5). The link partner's advertised OAMen is available in bit 1.2312.1 (see 45.2.1.245.4).

CI 192 SC 192.4.2.4.5 P257 L35 # 117

Muma, Scott Microchip

Comment Type T Comment Status A EZ

Should link the vendor specific data field in Table 192-14 to registers.

SuggestedRemedy

Insert: The vendor specific data the PHY sends to its link partner (see Table 192-14) may be controlled by bits 1.2316.15:0 (see 45.2.1.249). The vendor specific data received from the link partner may be observed in bits 1.2317.15:0 (see 45.2.1.250). The relationship between the field in Table 192-14 and the register bits is vendor specified.

Response Response Status C

ACCEPT.

CI 192 SC 192.5.2.5 P275 L3 # 45

Zherebtsov, Aleksei Infineon

Comment Type T Comment Status R signal level

192.5.2.5 states the transmitter peak output limits with "should" for -T1 on line 3 and for -V1 on line 4, so the peak-to-peak limits of Table 192-24 are recommendations and not requirements. The equivalent requirement in Clause 191, 191.6.2.7 on page 147 line 49, uses "shall". A transmit peak output limit expressed as a recommendation cannot be the basis of a conformance test, and there is no stated reason for Clause 192 to be weaker than Clause 191 for the same quantity.

SuggestedRemedy

In 192.5.2.5 change "The transmit differential signal at the -T1 MDI should be less than" to "The transmit differential signal at the -T1 MDI shall be less than", and change "The transmit signal at the -V1 MDI should be less" to "The transmit signal at the -V1 MDI shall be less".

Response Response Status C

REJECT.

This wording is intentional so that a PICS item and compliance test are not mandatory, given that the limits apply to all symbol sequences in all modes. If the limits are made to apply to a specific compliance test signal, then different additional limits may need to be specified for test purposes. The transmit power, PSD, and droop limits are specified and testable, and this limit is the expected result of those other constraints.

Changing "should" to "shall" without also addressing the test signal definition and new limits is not a sufficient remedy.

CI 192 SC 192.5.3.2 P306 L24 # 187

Regev, Alon Keysight

Comment Type T Comment Status R PICS

No PICS item cites subclause 192.5.3.2; only the base BER requirement of 192.5.3.1 appears to be covered in 192.13.4.8.3.

SuggestedRemedy

Add a PICS item covering the noise-rejection requirement in 192.5.3.2.

Response Response Status C

REJECT.

There are no mandatory requirements in 192.5.3.2.

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CI 192 SC 192.7.2.1 P280 L1 # 279
Wang, Frank Realtek Semiconductor Corp.
Comment Type TR Comment Status A EZ-R
typo
SuggestedRemedy
Change "Equation (192-29)" to "Equation (192-22)".
Response Response Status C
ACCEPT.

CI 192 SC 192.7.2.2 P281 L13 # 280
Wang, Frank Realtek Semiconductor Corp.
Comment Type TR Comment Status A EZ-R
typo
SuggestedRemedy
Change "Equation (192-31)" to "Equation (192-24)".
Response Response Status C
ACCEPT.

CI 192 SC 192.8.1.5 P284 L8 # 281
Wang, Frank Realtek Semiconductor Corp.
Comment Type TR Comment Status A EZ-R
According to
https://www.ieee802.org/3/dm/public/0726/Long_Comment_Resolutions_30,31,34,136,137,163.pdf, the value for f = 3000 is 45.
SuggestedRemedy
Change "1000 <= f <= 3000" to "1000 <= f < 3000".
Response Response Status C
ACCEPT.

CI 192 SC 192.9.2.1 P288 L13 # 282
Wang, Frank Realtek Semiconductor Corp.
Comment Type TR Comment Status A EZ-R
The value for f = Fmax is missing.
SuggestedRemedy
Change "400 <= f < Fmax" to "400 <= f <= Fmax".
Response Response Status C
ACCEPT.

CI 192 SC 192.10.2.1 P289 L28 # 283
Wang, Frank Realtek Semiconductor Corp.
Comment Type TR Comment Status A EZ-R
The value for f = Fmax is missing.
SuggestedRemedy
Change "400 <= f < Fmax" to "400 <= f <= Fmax".
Response Response Status C
ACCEPT.

CI 192 SC 192.13.3 P294 L6 # 143
Muma, Scott Microchip
Comment Type T Comment Status A PICS
Should define major modes like Leader/Follower, PHY_D/PHY_S, and speeds 100M, 2.5G, 5G, 7.5G, 10G as the major capabilities/options. Then use those to define which items are mandatory dependent on modes supported. There are other various clarifications possible in the PICS items I have given suggestions for fixes in the attachment.
SuggestedRemedy
See attachment for PICS items updates: 8023-192 d2p1 PICS comments
Apply changes with editorial license for PICS item and option numbering.
Response Response Status C
ACCEPT IN PRINCIPLE.
Implement the changes shown in https://www.ieee802.org/3/dm/public/0926/8023-192_d2p1_PICS_comments_no_xref.pdf
Grant Editor license to conform to Style, item naming, and numbering and to work with the clause 192 Champion to refine PICS content as needed.

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CI 192 SC 192.13.3 P294 L10 # 104
 Zimmerman, George CME Consulting/ADI,Cisco,Eliyan,Infineon,OnSemi,
 Comment Type T Comment Status A PICS
 Options for 7.5G needs an RX as well for the PAM-3 receiver
 SuggestedRemedy
 Add new PICS option 7.5GRX after 7.5GTX:
 7.5GRX 7.5 Gb/s receive data rate 192.1.1 Supports 7.5 Gb/s mode of operation, PHY_D
 O Yes[] No[]
 in 192.13.4.1 P297L13 add new PICS item PCST27 PAM3(Rx) 192.3.2.2.22 See
 193.2.2.22 7.5GRX:M Yes[]
 Response Response Status C
 ACCEPT IN PRINCIPLE.
 Accommodated by Comment #143.

CI 192 SC 192.13.4.2 P297 L30 # 180
 Regev, Alon Keysight
 Comment Type T Comment Status A EZ
 The PCS Receive table begins with "PCSR1" but the following four rows are labeled PCST2-
 PCST5, duplicating IDs already used for unrelated PCS Transmit requirements in the
 preceding table (192.13.4.1).
 SuggestedRemedy
 Renumber the PCS Receive rows PCSR2-PCSR5.
 Response Response Status C
 ACCEPT.

CI 192 SC 192.13.4.2 P297 L40 # 54
 Zhrebtssov, Aleksei Infineon
 Comment Type E Comment Status A EZ
 The Value/Comment entry of PICS item PCST4 reads "The Follower PHY shall uses". In
 addition the neighbouring item PCST3, which covers the Leader half of the same
 requirement, reads "The Leader PHY uses the", without "shall", so the two halves of one
 requirement are given different normative strength in the proforma.
 SuggestedRemedy
 Change "The Follower PHY shall uses" to "The Follower PHY uses", and align the wording
 of PCST3 and PCST4 with the normative form used in 192.3.2.3.2.
 Response Response Status C
 ACCEPT IN PRINCIPLE.
 Change "The Follower PHY shall uses" to "The Follower PHY uses".
 Editorial license to align the wording of PCST3 and PCST4 with the normative form used in
 192.3.2.3.2.

CI 192 SC 192.13.4.5.1 P299 L39 # 181
 Regev, Alon Keysight
 Comment Type T Comment Status A EZ
 Item ID "PMAR1" is used twice for two different requirements: "PMA Reset function,
 192.4.2.1" (p.299) and "PMA Receive, 192.4.2.3" (p.301).
 SuggestedRemedy
 reanme one set of items so PICS IDs are unique
 Response Response Status C
 ACCEPT IN PRINCIPLE.
 Replace "PMAR1" on P299, L39 with "RES1"

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CI 192 SC 192.13.4.5.2 P300 L6 # 182

Regev, Alon Keysight

Comment Type T Comment Status A EZ

In subclauses 192.13.4.5.2 item IDs "PMAT1" through "PMAT7" (functional PMA Transmit requirements) are reused in 192.13.4.8.2, as "PMAT1" through "PMAT14"

SuggestedRemedy

Give the electrical-specifications table a different ID prefix to avoid duplicate PICS item IDs.

Response Response Status C

ACCEPT IN PRINCIPLE.

Change item numbering in 192.13.4.8.2 from "PAMTx" to "XMTx" and change item numbering in 192.13.4.8.3 from "PMARx" to "RCVx"

CI 192 SC 192.13.4.5.2 P300 L25 # 34

Gorshe, Steve Microchip

Comment Type E Comment Status A EZ

Terminology correction

SuggestedRemedy

Change "loops" to "loop"

Response Response Status C

ACCEPT IN PRINCIPLE.

Change, "include loops timing"

to, "includes loop timing"

CI 192 SC 192.13.4.5.2 P300 L40 # 183

Regev, Alon Keysight

Comment Type T Comment Status A EZ

PMAT7 ("Launch power disable") cites subclause 192.3.2.2.1 ("Use of blocks", an unrelated PCS transmit-encoding subclause) as its normative reference. The actual requirement (PMA_transmit_disable causing average launch power per 192.5.2.4 when tx_symb = Z) is specified in 192.4.2.2.1 "Global PMA transmit disable".

SuggestedRemedy

Correct the Subclause reference to 192.4.2.2.1.

Response Response Status C

ACCEPT.

CI 192 SC 192.13.4.5.6 P302 L40 # 184

Regev, Alon Keysight

Comment Type T Comment Status A EZ

MF4 states "The Message Field setting for the first transmitted PMA burst is the first row of Table 192-13 for the Leader, and the first or second row of Table 192-10 for the Follower." Table 192-10 is "Nr, Np, and Nz values for 2.5 Gb/s mode transmission", unrelated to Message Field settings; the correct table (used earlier in the same sentence, and in the parallel 192.4.2.4.4 body text) is Table 192-13.

SuggestedRemedy

Change "Table 192-10" to "Table 192-13".

Response Response Status C

ACCEPT.

CI 192 SC 192.13.4.5.11 P305 L25 # 179

Regev, Alon Keysight

Comment Type T Comment Status A EZ

Body text (192.4.2.4.11) specifies the Follower's transmit-alignment offset as "176 ns - delay_count × 5.333 ns (± 5.333 ns)". PICS item ST4 (192.13.4.5.11) states the same requirement as "17 ns - delay_count × 5.333 ns (± 5.333 ns)"; missing a digit.

SuggestedRemedy

Correct ST4 to read "176 ns", matching the body text.

Response Response Status C

ACCEPT.

CI 192 SC 192.13.4.8 P306 L24 # 186

Regev, Alon Keysight

Comment Type T Comment Status A PICS

No PICS item in 192.13.4.8 cites subclause 192.5.2.5 or the peak-to-peak output limits of Table 192-24; there is a gap in PICS coverage between the items covering 192.5.2.4 and the next covered subclause.

SuggestedRemedy

Add a PICS item covering 192.5.2.5 / Table 192-24.

Response Response Status C

ACCEPT IN PRINCIPLE.

Consider after Comment #45 is resolved.

Editorial license to adjust to comment #45 resolution, if needed.

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CI 192 **SC 192.13.4.8.2** **P308** **L24** # **35**
 Gorshe, Steve Microchip
Comment Type **T** **Comment Status** **A** **PICS**
 Add PAM3
SuggestedRemedy
 Insert PAM3 into the PAM4 phrase such that it reads: "...less than 15 mV for PAM3 and PAM4 transmitters."
Response **Response Status** **C**
 ACCEPT IN PRINCIPLE.

 Grant editorial license to split into 3 requirements for PAM2, PAM3, and PAM4. Make PAM2 requirement status M, and the PAM3 dependent on 7.5G transmit (TX7.5G:M) and the PAM4 dependent on 10G transmit (TX10G:M).

CI 192 **SC 192.13.4.8.2** **P308** **L24** # **185**
 Regev, Alon Keysight
Comment Type **T** **Comment Status** **A** **PICS**
 PMAT5 states the distortion limit applies to "PAM2 transmitters" and "PAM4 transmitters". The normative body text (192.5.2.2) states the 15 mV limit applies to "PAM3 and PAM4 transmitters"
SuggestedRemedy
 Add "PAM3 and" before "PAM4 transmitters" in PMAT5.
Response **Response Status** **C**
 ACCEPT IN PRINCIPLE.

 Accommodated by Comment #185.

CI 192 **SC 192.13.4.9.2** **P310** **L37** # **188**
 Regev, Alon Keysight
Comment Type **T** **Comment Status** **A** **EZ**
 Items LSV1 and LSV2 are correctly prefixed for -V1, but the remaining five rows (Screening attenuation, Propagation delay, Coupling test methodologies, PSANEXT, PSAACRF) are labeled "LST3" through "LST7", duplicating IDs already used for different requirements in the preceding -T1 table (192.13.4.9.1).
SuggestedRemedy
 Renumber the -V1 table's rows LSV3-LSV7.
Response **Response Status** **C**
 ACCEPT.

CI 192 **SC 192.13.4.9.2** **P310** **L37** # **50**
 Zhrebtssov, Aleksei Infineon
Comment Type **T** **Comment Status** **A** **EZ**
 The -V1 link segment table reuses item numbers that the -T1 table on the same page already uses for different features. For example LST3 is "Coupling attenuation, -T1" at page 310 line 13 and "Screening attenuation, -V1" at page 310 line 37. The same defect runs through the whole 192.13 proforma: PCST2 to PCST5 appear both in the PCS Transmit table on page 295 and in the PCS Receive table on page 297; PMAT1 to PMAT7 appear both in the PMA table on page 300 and in the transmitter electrical table on page 308; PMAR1 appears three times, on pages 299, 301 and 309; PMAR2, LST3 to LST7 and MDIT3 appear twice each. Nineteen item numbers in the proforma are not unique, so a completed proforma cannot be interpreted.

SuggestedRemedy
 Renumber the 192.13 proforma so that every item number is unique, using a distinct prefix per table, for example PCSR for the PCS Receive items, TES for the transmitter electrical items, RES for the receiver electrical items, LSV for the -V1 link segment items and MDIV for the -V1 MDI items.

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

Accomodated by Comment #181, Comment #182, Comment #188, and Comment #190.

CI 192 **SC 192.13.4.10.1** **P311** **L16** # **189**
 Regev, Alon Keysight
Comment Type **T** **Comment Status** **A** **EZ**
 MDIT2 ("Return loss, -T1") states the measurement is made "with a nominal impedance of 50 O". The -T1 MDI is differential/balanced with a 100 O nominal characteristic impedance per 192.7.1.2 and 192.9.2.1 body text; 50 O is the -V1 value (correctly used in the parallel item MDIV2).

SuggestedRemedy
 Change MDIT2's nominal impedance value to 100 O.

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

Change MDIT2's nominal impedance value to 100 O where O is the ohms symbol.

CI 192	SC 192.13.4.10.2	P311	L34	# 190
Regev, Alon		Keysight		
Comment Type	T	Comment Status	A	EZ
The -V1 fault-tolerance PICS item is labeled "MDIT3", reusing the -T1 table's item ID (MDIT3, "Fault tolerance, -T1", 192.9.3) instead of a -V1-prefixed ID.				
SuggestedRemedy				
Relabel as "MDIV3".				
Response	Response Status C			
ACCEPT.				