D3.0 Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Auto

Comment Type: E  Comment Status: D  EZ
According to the SA Editors, the "IMPORTANT NOTICE" is not needed and can be deleted.

SuggestedRemedy
Delete lines 16 through 27.

Proposed Response  Response Status: W  PROPOSED ACCEPT.

Comment Type: G  Comment Status: D  EZ
This draft meets all editorial requirements.

SuggestedRemedy

Proposed Response  Response Status: W  PROPOSED ACCEPT.

Comment Type: E  Comment Status: D  EZ
Update publication date for 802.3cg

SuggestedRemedy
Change 20xx (or 201x) to 2019, also on P10 L49

Proposed Response  Response Status: W  PROPOSED ACCEPT.

Comment Type: E  Comment Status: D  EZ
Replace lower case 'x' with a multiplication symbol.

SuggestedRemedy
Make this change on P79 L44 & P79 L 45.

Proposed Response  Response Status: W  PROPOSED ACCEPT.

Comment Type: E  Comment Status: D  EZ
"IEEE Std 802.3cg-201x" is now published as "IEEE Std 802.3cg-2019"

SuggestedRemedy
change "IEEE Std 802.3cg-201x" to "IEEE Std 802.3cg-2019" in multiple locations

Proposed Response  Response Status: W  PROPOSED ACCEPT.
IEEE Std 802.3cg-201x has been approved as IEEE Std 802.3cg-2019

Suggested Remedy
change 802.3cg-201x to 802.3cg-2019 on P23 L45, and globally (several instances - pages 26, 33, 34, 35, 53, 55, 58, 66, 67, 68, 69, 195 - some more than 1 per page)

Proposed Response Response Status Z
PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

Not all instances of "Reserved" should be changed to "undefined" in the identified cell, also the spacing around the "=" is not consistent in the suggestion.

Change "Reserved" to "undefined" for the values 01 and 10 in the description of bits 1.2311.12:11 in Table 45-155c, and (2) to add a new paragraph to 45.2.1.194.1 stating, "The values of L = 2 and L = 4 are not defined for 2.5GBASE-T1 PHYs, and the value of L = 4 is not defined for 5GBASE-T1 PHYs. If bits 1.2311.12:11 are set to these values, the PHY will communicate these values to the link partner, but the requested interleaver depth is out of scope of this standard and may not be supported by the link partner." Add a new paragraph to 45.2.1.195.1 stating, "The values of L = 2 and L = 4 are not defined for 2.5GBASE-T1 PHYs, and the value of L = 4 is not defined for 5GBASE-T1 PHYs. Bits 1.2312.12:11 will indicate whatever value is received from the link partner, but if the undefined values are received, the requested interleaver depth is out of scope of this standard and may not be supported by the local PHY."

Proposed Response Response Status W
PROPOSED ACCEPT IN PRINCIPLE.

Not all instances of "Reserved" should be changed to "undefined" in the identified cell, also the spacing around the "=" is not consistent in the suggestion.

Change "Reserved" to "undefined" for the values 01 and 10 in the description of bits 1.2311.12:11 in Table 45-155c, and (2) to add a new paragraph to 45.2.1.194.1 stating, "The values of L = 2 and L = 4 are not defined for 2.5GBASE-T1 PHYs, and the value of L = 4 is not defined for 5GBASE-T1 PHYs. If bits 1.2311.12:11 are set to these undefined values, the PHY will communicate these values to the link partner, but the requested interleaver depth is out of scope of this standard and may not be supported by the link partner." Add a new paragraph to 45.2.1.195.1 stating, "The values of L = 2 and L = 4 are not defined for 2.5GBASE-T1 PHYs, and the value of L = 4 is not defined for 5GBASE-T1 PHYs. Bits 1.2312.12:11 will indicate whatever value is received from the link partner, but if the undefined values are received, the requested interleaver depth is out of scope of this standard and may not be supported by the local PHY."
149.3.2.2.18 doesn't describe Reed Solomon interleaving, it describes the PCS Scrambler. The correct reference is 149.3.2.2.15. The same issue exists in 45.2.1.195.1 page 39 line 38.

**Suggested Remedy**

Change cross reference from 149.3.2.2.18 to 149.3.2.2.15 (or appropriate link if renumbered) in both 45.2.1.194.1 and 45.2.1.195.1

**Proposed Response**

PROPOSED ACCEPT.

The word "both" appears verbose in nearly 20 instances.

**Suggested Remedy**

Remove the term "both" appearing twice in nearly 20 instances.

**Proposed Response**

PROPOSED REJECT.

The word "both" is found 24 times in the document. The proposed change in the comment does not contain sufficient detail so that the CRG can understand the specific changes that satisfy the commenter. The commenter does not specify which "nearly 20" instances should be deleted. This is used in the front matter 3 times and 21 times in the "new text". A search of 802.3-2018 shows that the word "both" is found 938 times. This is a word commonly used in this specification to indicate that there are two conditions or two actions.

Regarding the specific instance cited in the comment at page 40 line 36, the CRG disagrees with the commenter. The use of 'both' in this instance is not extraneous and clarifies that MultiGBASE-T1 OAM capability requires support by both the local PHY and its link partner.

"When the transmitter is in test mode 2, bits 1.2313.1:0 control the pattern of the jitter test signal." - what these bits do when the transmitter is not in test mode 2 is not specified...

**Suggested Remedy**

Suggest to add a new second sentence immediately following the quoted one, to read as follows: "When the transmitter is not in test mode 2, the setting of bits 1.2313.1:0 have no effect."

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE.

fix subject/verb agreement in proposal: Add the sentence "When the transmitter is not in test mode 2, the setting of bits 1.2313.1:0 has no effect."

Table 45-244 should appear on page 47 following this text: "Change Table 45-244 as follows:"

**Proposed Response**

PROPOSED ACCEPT.

Editing instruction has been separated from the table that it is editing.

**Suggested Remedy**

Make editing instruction stay with Table 45-341

**Proposed Response**

PROPOSED ACCEPT.
Table 78-4, in the 2.5GBASE-T1 Case-4 row and \( T_{\text{phy_shrink_tx}} \) column the value 120 should be changed to 128. See comment 22 on the initial working group ballot said to implement the values in graba_3ch_01a_0719.pdf in Table 78-4. The error was made in the initial edit.

**Suggested Remedy**

For the 2.5GBASE-T1 Case-4 row and \( T_{\text{phy_shrink_tx}} \) column change the value "120" to "128"

**Proposed Response**

PROPOSED ACCEPT.

---

Clause 97 is in the draft, but is shown as an external cross reference. It should be an active cross reference

**Suggested Remedy**

Change external "Clause 97" reference to an active cross reference

**Proposed Response**

PROPOSED ACCEPT.
D3.0 Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Auto

Comment Type TR Comment Status D

Proposed Response Response Status W

The overview and the draft indicate that clause 149 operates over a single balanced pair of conductors. As in other standards, this may include either cabling or a backplane link segment. However, in several portions of the link segment specification, the requirements are written so that ONLY a separate cabling link segment can be used. This is in conflict with the overview and purpose. A slight adjustment to the wording, and a conditional on the PICS will make it clear that requirements such as coupling attenuation and shielding attenuation are only intended to apply to cabling link segments.

Suggested Remedy

page 167 line 10 : At 149.7, change the last sentence of the first paragraph from "The term link segment used in this clause refers to a single shielded balanced pair of conductors operating in full duplex. " to "The term link segment used in this clause refers to a single balanced pair of conductors (cable or backplane) operating in full duplex. "

Page 17 line 31: at 149.7.1.4, change the first sentence from "when tested using the IEC 62153-4-7 triaxial tube in tube method as specified in Annex 149A, the MultiGBASE-T1 link segment shall meet the coupling attenuation values " to "when tested using the IEC 62153-4-7 triaxial tube in tube method as specified in Annex 149A, where shielded balanced pair cabling is used, the MultiGBASE-T1 link segment shall meet the coupling attenuation values".

Page 172 line 27: Change the first sentence of 149.8.1 from "The mechanical interface to the shielded balanced cabling " to "Where shielded balanced pair cabling is used, the mechanical interface to the shielded balanced cabling"

Page 179 line 10, 149.11.3, insert row for *INS after row for *EEE, reading: *INS | Installation / cabling | 149.7 | Items marked with INS include installation practices and cabling specifications applicable when the link segment is balanced pair cabling, and not applicable to backplane link segments | O | Yes [ ]

PROPOSED ACCEPT.
"The MultiGBASE-T1 OAM information is exchanged between two 2.5GBASE-T1, 5GBASE-T1, or 10GBASE-T1 PHYs out-of-band." - the concept of whether this is out-of-band in the frequency domain or does not consume the bit rate for the ethernet payload has caused repeated confusion - some improved wording here might help.

**SuggestedRemedy**

Suggest change "out-of-band." to "out-of-band, that is, outside of the specified 2.5, 5, or 10 Gb/s Ethernet data stream."

**Proposed Response**

PROPOSED ACCEPT.

---

"tx_group50x65B is used in several places but it loosely defined and never formally defined. There can be misinterpretation of the bit ordering.

**SuggestedRemedy**

(Editorial Note. I cannot show subscripts in the spreadsheet so I will enclose anything that needs to be subscripted with **. For example A*n* is An with n subscripted. I'm not sure if the carriage return will work in this box.)

The text description of what to do is hard to understand and the usage of *** to indicate both subscripts and multiplication is confusing.

Implement the changes show in wienckowski_3ch_D3p0_comment51.pdf.

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE.

---

"The minimum link segment characteristics, EMC requirements, and test modes are specified in 149.5." - the link segment characteristics are specified in 149.7, not 149.5, and there are no EMC requirements in this document. Further, this subclause is supposed to be describing the PMA, not the other things.

**SuggestedRemedy**

Suggest replacing "The minimum link segment characteristics, EMC requirements, and test modes are specified in 149.5." with "The electrical parameters of the PMA, i.e., test modes, and electrical specifications for the transmitter and receiver, are specified in 149.5."

**Proposed Response**

PROPOSED ACCEPT.
D3.0 Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Auto

Comment Type E Comment Status D

Inconsistency in document. Sometimes "true" and sometimes "TRUE".

SuggestedRemedy


Also, change "True" to "TRUE" on P136 L19.

PROPOSED ACCEPT IN PRINCIPLE.

Comment Type E Comment Status D

ordered set in the subclause header should be capitalized

SuggestedRemedy

Change "149.3.2.2.11 ordered set" to "149.3.2.2.11 Ordered set"

PROPOSED ACCEPT.

Comment Type E Comment Status D

number on top of "pi" symbol is cut off

SuggestedRemedy

Resize equation to ensure complete equation is visible.

PROPOSED ACCEPT.

Comment Type E Comment Status D

superscript of 4 in x^4 is higher than the other superscripts

SuggestedRemedy

Adjust height of "4" in "x^4" to match height of other x superscripts.

PROPOSED ACCEPT.
Lo, William

Comment Type: T  Comment Status: D  RS-FEC

The transmitted order of the codeword symbol can be made more explicit. Page 102 line 30 state bit 0 is transmitted first. From Page 102 line 6 m*i,0* can be inferred as bit 0 but this is not explicitly stated. Page 100 line 29 adds to the confusion that states the leftmost element is the LSB and we have m*i,9* being the leftmost element.

Suggested Remedy

Add the following for more clarity. Page 102 line 7 after the end of "finite field." add: "m*i,0* is the first bit transmitted." Add the following to make things complete. Copy first sentence in page 102 line 6 to page 102 line 22 except replace "message" with "parity" and "m", with "p", add: "p*i,0* is the first bit transmitted."

Proposed Response  Response Status: W  PROPOSED ACCEPT.

Zimmerman, George

Comment Type: T  Comment Status: D  EZ

"PHYs with the EEE capability support transition to the LPI mode when the PHY has successfully completed training and pcs_data_mode is TRUE and subject to the timing requirements of 46.3.1.5." There are no timing requirements for the PHY transitioning in 46.3.1.5. It appears this is meant to reference 46.1.7 which requires the link be operational for at least one second before transitioning to LPI.

Suggested Remedy

Change cross reference to 46.3.1.5 to 46.1.7

Proposed Response  Response Status: W  PROPOSED ACCEPT.

Zimmerman, George

Comment Type: E  Comment Status: D  EZ

"The optional 2.5GBASE-T1, 5GBASE-T1, or 10GBASE-T1 EEE capability allows compliant PHYs to transition to an LPI mode of operation when link utilization is low." isn't quite correct - EEE is independent on each direction, link utilization is not. therefore, the statement needs to be expanded - particularly because the expected applications are often asymmetric in utilization.

Suggested Remedy

change "when link utilization is low." to "when link utilization is low in either direction of transmission."

Proposed Response  Response Status: W  PROPOSED ACCEPT.

Wienckowski, Natalie

Comment Type: E  Comment Status: D  EZ

To maximize power savings, maintain link integrity, and ensure interoperability,
D3.0 Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Auto

Comment Type: E  Comment Status: D  EZ
Comment: Consider replacing "maximize" per IEEE Mandatory Editorial Coordination comment. Note: This is part of the "common" wording used throughout 802.3. See 97.3.5.1, 113.3.5.1, 126.3.5.1, etc. The reasons for synchronizing refresh intervals is not required for the spec.

Suggested Remedy
Delete: To maximize power savings, maintain link integrity, and ensure interoperability,

Proposed Response  Response Status: W  PROPOSED ACCEPT.

Comment Type: E  Comment Status: D  EZ
Comment: Consider rewording to remove "ensures".

Suggested Remedy
Change: This offset ensures that the MASTER and SLAVE ALERT windows are offset from each other and that the refresh periods are close to half cycle offset. To: The MASTER and SLAVE ALERT windows are offset from each other and the refresh periods are close to half cycle offset.

Proposed Response  Response Status: W  PROPOSED ACCEPT.

Comment Type: E  Comment Status: D  EZ
Comment: Consider replacing "maximize" per IEEE Mandatory Editorial Coordination comment. Note: This is part of the "common" wording used throughout 802.3. See 97.3.5.3, 113.3.5.3, 126.3.5.3, etc. The reasons for staggering refresh signals is not required for the spec.

Suggested Remedy
Change: refresh signaling to maximize power savings. To: refresh signaling.

Proposed Response  Response Status: W  PROPOSED ACCEPT.
D3.0 Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Auto

Comment Type: E
Comment Status: D

LP_BLOCK_R is not consistent with other comment names.

Suggested Remedy:
Change "LP_BLOCK_R" to "LPBLOCK_R" to be consistent with other comment names.
Also make the same change on P125 L7.

Proposed Response: W
Response Status: PROPOSED ACCEPT.

Comment Type: E
Comment Status: D

I_BLOCK_R is not consistent with other comment names.

Suggested Remedy:
Change "I_BLOCK_R" to "IBLOCK_R" to be consistent with other comment names. Also make the same change on P125 L14.

Proposed Response: W
Response Status: PROPOSED ACCEPT.

Comment Type: T
Comment Status: D

DECODE (rx_symb<64:0>) - the text says that the argument is rx_coded<64:0>. rx_symb is what is passed by the PMA_UNITDATA indication, before the descrambler, blocking and RS-FEC decoder (see 149.3.2.3). rx_coded is what seems to be needed by this function according to the description.

Suggested Remedy:
Change DECODE (rx_symb<64:0>) to DECODE(rx_coded<64:0>)

Proposed Response: W
Response Status: PROPOSED ACCEPT.
D3.0 Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Auto

**Comment Type E**  Comment Status D  EZ
"super frame" - in most places, the term is "superframe" without a space.

**SuggestedRemedy**
replace "super frame" with "superframe" at P128 L37, L46, L51, L53; P129 L7, and PICS OAM2 description (P185 L11, L13, L15)

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

**Comment Type E**  Comment Status D  EZ
The use of "0s" is not consistent with other 802.3 Clauses.

**SuggestedRemedy**
Change "0s" to "0's".  Also make the same change on P129 L 27 and P185 L20.

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

**Comment Type E**  Comment Status D  EZ
Consider replacing "ensure" per IEEE Mandatory Editorial Coordination comment.  Note: This is the same wording as 97.3.8.2.7.

**SuggestedRemedy**
Change: The toggle bit is used to ensure proper OAM message synchronization between the PHY and the link partner.  To:  The toggle bit lets the management entity determine which OAM message is being referred to.

**Proposed Response**  Response Status W
PROPOSED ACCEPT.
P802.3ch D3.0 D3.0 Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Auto

Ci 149 SC 149.3.9.2.17 P 133 L 31 # I-31
Wienckowski, Natalie General Motors Company
Comment Type E Comment Status D EZ

Suggested Remedy
- Add space after "is occurring concurrently and bi-directionally."

Proposed Response Response Status W
PROPOSED ACCEPT.

Ci 149 SC 149.3.9.3 P 135 L 27 # I-93
Tu, Mike
Comment Type T Comment Status D late
The register bit mappings for OAM status messages are inconsistent with the definition given in Figure 149-25 (line 30 and line 34 on page 142).

Suggested Remedy

Proposed Response Response Status W
PROPOSED ACCEPT.

Ci 149 SC 149.3.9.3 P 135 L 32 # I-92
Tu, Mike
Comment Type T Comment Status D late
The variable "mr_rx_message" does not exist. Its name should be "mr_rx_lp_message".

Suggested Remedy
Within Table 149-9, on line 32, 34, 37, and 39, replace "mr_rx_message" by "mr_rx_lp_message".

Proposed Response Response Status W
PROPOSED ACCEPT.

Ci 149 SC 149.3.9.3.9.2.17 P 133 L 31 # I-31
Wienckowski, Natalie General Motors Company
Comment Type E Comment Status D

Suggested Remedy
Delete the reference to state diagram notation as this is done in 149.1.6 for the Clause.

Proposed Response Response Status W
PROPOSED ACCEPT.

Ci 149 SC 149.4.2.3 P 144 L 49 # I-37
Wienckowski, Natalie General Motors Company
Comment Type E Comment Status D EZ

Suggested Remedy
Delete "The notation used in the state diagrams follows the conventions of state diagrams as described in 21.5."

Proposed Response Response Status W
PROPOSED ACCEPT.

Ci 149 SC 149.4.2.4 P 145 L 21 # I-38
Wienckowski, Natalie General Motors Company
Comment Type E Comment Status D EZ

Suggested Remedy
Change "over receive pair" To "over the receive pair".

Proposed Response Response Status W
PROPOSED ACCEPT.

Ci 149 SC 149.4.2.4 P 145 L 21 # I-38
Wienckowski, Natalie General Motors Company
Comment Type E Comment Status D EZ

Suggested Remedy
Change "PHY Control shall comply with the state diagram description given in Figure 149-32." To "PHY Control shall comply with the state diagram in Figure 149-32."

Proposed Response Response Status W
PROPOSED ACCEPT.
Comment Type  E  Comment Status  D  EZ
Wienckowski, Natalie  General Motors Company
SuggestedRemedy
Change "16th partial PHY frame (bits 6750 to 6845) of the PHY frame." To "16th partial PHY frame (bits 6750 to 6845)."
Proposed Response  Response Status  W  PROPOSED ACCEPT.

Comment Type  E  Comment Status  D  EZ
Wienckowski, Natalie  General Motors Company
SuggestedRemedy
Consider replacing "ensure" per IEEE recommendation. It is not required to explain why this requirement exists.
Proposed Response  Response Status  W  PROPOSED ACCEPT.

Comment Type  E  Comment Status  D  EZ
Wienckowski, Natalie  General Motors Company
SuggestedRemedy
Change: Infofield shall be transmitted at least 256 times with each change to octets 7-10 to ensure detection at link partner. To: Infofield shall be transmitted at least 256 times with each change to octets 7-10.
Proposed Response  Response Status  W  PROPOSED ACCEPT.

Comment Type  E  Comment Status  D  EZ
Wienckowski, Natalie  General Motors Company
SuggestedRemedy
Consider replacing "guarantees" per IEEE Mandatory Editorial Coordination comment. Note: This wording is the same as 97.4.2.4.6
Proposed Response  Response Status  W  PROPOSED ACCEPT.

Comment Type  E  Comment Status  D  EZ
Wienckowski, Natalie  General Motors Company
SuggestedRemedy
Add non-breaking spaces around +/- symbol, also on P152 L49.
Proposed Response  Response Status  W  PROPOSED ACCEPT.
This state diagram section including subclauses 149.4.4.1, 149.4.4.2, and 149.4.5 lacks description of the state diagram conventions. State diagram conventions are stated in 149.3.7.1 and 149.3.9.4.1, however the text states those conventions apply only to those subclauses.

**Suggested Remedy**

Insert new subclauses and renumber remaining subclauses as needed. 

"149.4.4 Detailed functions and state diagrams
149.4.4.1 State diagram conventions

The body of this subclause is comprised of state diagrams, including the associated definitions of constants, variables, functions, counters, and messages. Should there be a discrepancy between a state diagram and descriptive text, the state diagram prevails. The notation used in the state diagrams follows the conventions of 21.5.

**Proposed Response**

This text is not needed as this is done in 149.1.6 for the Clause. The conventions are being removed from 149.3.7.1 (Comment 32) and 149.3.9.4.1 (Comment 33).

**Proposed Response**

PROPOSED REJECT.
<table>
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<td>PROPOSED ACCEPT.</td>
<td>W</td>
<td>Wienckowski, Natalie</td>
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</table>

Comment Type: E - Editorial, D - Drafting

Comment Status: EZ - Reviewed by Editing Team, D - Dispatched

Proposed Response: W - Written

Commenter: Wienckowski, Natalie, General Motors Company

Suggested Remedy:

- For Cl. 149 SC 149.5.2.2, Line 50:
  - Change "10GBASE-T1, 36 dB in 5GBASE-T1 and 35 dB in 2.5G mode" to "10GBASE-T1, 36 dB in 5GBASE-T1, and 35 dB in 2.5G mode".
  - Proposed Response: PROPOSED ACCEPT.

- For Cl. 149 SC 149.7.2, Line 40:
  - Change: To ensure the total alien NEXT loss and alien FEXT loss coupled between link segments is limited, power sum alien near-end crosstalk (PSANEEXT) loss and power sum alien attenuation to crosstalk ratio far-end (PSAACR-F) is specified.
  - Proposed Response: PROPOSED ACCEPT.

- For Cl. 149 SC 149.7.2.1, Line 48:
  - Change: To ensure the total alien NEXT loss and alien FEXT loss coupled between link segments is limited, power sum alien near-end crosstalk (PSANEEXT) loss and power sum alien attenuation to crosstalk ratio far-end (PSAACR-F) are specified to limit the total alien NEXT and alien FEXT coupled between link segments.
  - Proposed Response: PROPOSED ACCEPT.

- For Cl. 149 SC 149.7.2.2, Line 42:
  - Change: To ensure the total alien NEXT loss and alien FEXT loss coupled between link segments is limited, power sum alien near-end crosstalk (PSANEEXT) loss and power sum alien attenuation to crosstalk ratio far-end (PSAACR-F) are specified to limit the total alien NEXT and alien FEXT coupled between link segments.
  - Proposed Response: PROPOSED ACCEPT.

The CRG disagrees with the commenter. This equation defines what is required for the PHYs to operate properly. This applies to all link segments. While it is likely that only shielded cables can meet this requirement, specifying that this requirement only applies to shielded cables would have the unintended side effect of allowing a violation of this equation’s limits if unshielded cables were used.
### D3.0 Physical Layer Specifications and Management Parameters for 2.5 Gb/s, 5 Gb/s, and 10 Gb/s Auto

#### Kumada, Taketo

**Comment Type**: T  
**Comment Status**: D  
**Link Segment**

Equation 149-26 draws this required line based on the measurement results when all the cables configured around are composed of STP cables in the 4 around 1 measurement. Therefore, I think it is necessary to include a comment that clearly states that all the cables that are configured around are STP cables. This is because it is assumed that it is difficult to satisfy this requirement when the surrounding cables are composed of cables such as J-UTP cable and UTP cable.

**Suggested Remedy**

After Equation 149-26, please add as follows. However, this equation is for the case where the surrounding cables are composed of STP cables.

**Proposed Response**

**Response Status**: W  
**PROPOSED REJECT.**

The CRG disagrees with the commenter. This equation defines what is required for the PHY's to operate properly. This applies to all link segments. While it is likely that only shielded cables can meet this requirement, specifying that this requirement only applies to shielded cables would have the unintended side effect of allowing a violation of this equation's limits if unshielded cables were used.

#### Wienckowski, Natalie

**Comment Type**: E  
**Comment Status**: D  
**Empty Subclause**

**Suggested Remedy**

Delete subclause

**Proposed Response**

**Response Status**: W  
**PROPOSED ACCEPT.**

There is no content and there has been no proposal for content. It should be removed.

#### Mcclellan, Brett

**Comment Type**: TR  
**Comment Status**: D  
**EZ**

The subclause '149.8.2.2 MDI coupling attenuation' has no content and there has been no proposal for content. It should be removed.

**Suggested Remedy**

delete subclause 149.8.2.2

**Proposed Response**

**Response Status**: W  
**PROPOSED ACCEPT.**

There is no content and there has been no proposal for content. It should be removed.

#### Wienckowski, Natalie

**Comment Type**: T  
**Comment Status**: D  
**Environment**

There is an untestable shall.

**Suggested Remedy**

Delete: All equipment subject to this clause shall conform to IEC 62368-1 (or IEC 60950-1) (for IT and motor vehicle applications) and to ISO 26262 (for motor vehicle applications only, if required by the given application). Also delete PICS ES1.

**Proposed Response**

**Response Status**: W  
**PROPOSED ACCEPT.**

There is an untestable shall.

**Suggested Remedy**

Change "All equipment subject to this clause shall conform to all applicable local, state, national, and application-specific standards." To "All equipment subject to this clause is expected to conform to all applicable local, state, national, and application-specific standards." Also delete PICS ES2.

**Proposed Response**

**Response Status**: W  
**PROPOSED ACCEPT.**
There is an untestable shall which applies to the final instalation, not the PHY defined by this draft.

Suggested Remedy
Delete: In automotive applications, all cabling shall be routed in such a way as to provide maximum protection by the motor vehicle sheet metal and structural components, following SAE J1292, ISO 14229, and ISO 15764. Also delete PICS ES3.

PROPOSED ACCEPT.

ISO 167540-5 is a typo copied from Clause 96, ISO 16750-5 is the correct reference

Suggested Remedy
Change "ISO 167540-5" to "ISO 16750-5"

PROPOSED ACCEPT.

Section title should be "PCS Receive" not "PCS Transmit"

Suggested Remedy
Change "PCS Transmit" to "PCS Receive"

PROPOSED ACCEPT.

As per attached PDF; Propose to change Figure 149A-2 as follows; From the VNA Diff. Port 1 both these lines are to be coax. Therefore, The lines are made to be thicker to match the width of coax line from as from Port 2. Add that the text to each line from Diff. Port 1 of "Coax"; Add lines that show that each of the Coax shields from Diff. Port 1 connects to the shield of connector on the test fixture; Show an exploded view that inner tube is connected to cable shield inside triaxial tube; Include the text next to this exploded view.

PROPOSED ACCEPT.
Comment Type: T  Comment Status: D  149A
Propose to add verbiage to the shield connection of the cable on both ends to assist user with proper understanding of implementing into vehicle.

Suggested Remedy
Add the following to sentences at the end of paragraph that starts on line 6. In addition, both ends of the cable shield should be directly connected to the signal ground using techniques suitable for RF applications in the frequency range of interest when implementing cable assemblies into vehicles. This is necessary so that the vehicle implementation matches the coupling and screening attenuation test methodology in this Annex.

Proposed Response  Response Status: W  PROPOSED ACCEPT IN PRINCIPLE.

It is not necessary to explain why the requirement exists.

ADD the following sentence at the end of paragraph that starts on page 198 line 6. "In addition, both ends of the cable shield should be directly connected to the signal ground using techniques suitable for RF applications in the frequency range of interest when implementing cable assemblies into vehicles."

Comment Type: TR  Comment Status: D  149A
Text does not adequately deal with specifying a uniform test condition for qualifying the test conditions for link segments in an automotive environment. Text should be added to reflect the shield grounding practice used in that environment.

Suggested Remedy
Insert the following text before the existing text on Page 198, Line 24: The shield of the cable shall have a hard ground connection to the connected equipment at each end of the reference cable assembly.

Proposed Response  Response Status: W  PROPOSED ACCEPT IN PRINCIPLE.

It is not clear what a "hard ground" connection means.

ADD the following sentence at the end of the paragraph that starts on page 198 line 6. "In addition, both ends of the cable shield should be directly connected to the signal ground using techniques suitable for RF applications in the frequency range of interest when implementing cable assemblies into vehicles."

Comment Type: ER  Comment Status: D  149A
"PHY TempWarning" for D5 doesn't match the bit name in 149B.3.3, "Internal temperature warning"

Suggested Remedy
change "PHY TempWarning" to "Internal temperature warning"

Proposed Response  Response Status: W  PROPOSED ACCEPT.

OAM Symbol 11 bits 7:0 are 'Reserved' which means they cannot be used for any purpose and a compliant device must set these bits to zero. The proposal for this definition(http://www.ieee802.org/3/ch/public/nov18/wienckowski_3ch_01b_1118.pdf) indicated that this symbol is reserved for future use, however it cannot be used by a device compliant to this informative annex.

Making these vendor defined bits allows them to be defined by OEMs or other organizations. Leaving these bits as zero for later use isn't necessary as any later project is free to define a new status structure.

Suggested Remedy
page202 line 32 change Symbol 11 bits D7 to D0 from individual reserved bits to "Vendor-specific field <7:0>"page 203 line 49 insert new subclause 149B.3.7 and renumber remaining subclauses: "149B.3.7 Vendor-specific fieldVendor-specific field <7:0> is indicated in OAM<11><7:0> and may be used to convey a vendor defined data field.

Proposed Response  Response Status: W  PROPOSED ACCEPT.
The conditions and duration for which these defined warning bits are left to the implementor to decide, but how long should the indicator bits be set =1 to ensure the management entity at the link partner has an opportunity to detect these status bits? These bits are not placed into latched indicators at the link partner, but are continuously updated in registers 1.2318 and 1.2319 as they arrive. These bits are not placed into latched indicators at the link partner, but are continuously updated in registers 1.2318 and 1.2319 as they arrive. For these bits: PowerSupplyWarning, PHY TempWarning, No MACMessagesWarning, DegradedLinkSegment we should recommend a minimum indication time. PolarityInversion is a static condition throughout the link, and therefore not an issue.

**Proposed Response**

It is recommended that this status is set for a minimum of 100 milliseconds to ensure reception by the link partner management entity.

**Proposed Accept.**

**Comment Type:** TR

**Comment Status:** D

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**Comment Type:** E

**Comment Status:** D

missing definition for ++ operator

**Suggested Remedy**

page 204 line 33 add text: "The notation ++ after a counter or integer variable indicates that its value is to be incremented."

**Proposed Response**

**Response Status:** W

**PROPOSED ACCEPT.**

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**Comment Type:** T

**Comment Status:** D

Need to add reference to state diagram notation extensions as done in 149.1.6.

**Suggested Remedy**

Change "The notation used in the state diagrams follows the conventions of state diagrams as described in 21.5." To "The notation used in the state diagrams follows the conventions of state diagrams as described in 21.5, along with the extensions described in 145.2.5.2."

**Proposed Response**

**Response Status:** W

**PROPOSED ACCEPT.**

Should be "FALSE" only when this represents a variable value.

**Comment Type:** T

**Comment Status:** D

Need to add reference to state diagram notation extensions as done in 149.1.6.

**Suggested Remedy**


Also, change "False" to "FALSE" on P136 L20.

**Proposed Response**

**Response Status:** W

**PROPOSED ACCEPT.**

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**Comment Type:** T

**Comment Status:** D

**State Diagrams**

**Suggested Remedy**

page 205 line 16 insert new variable definition

"rf_valid Defined in 149.3.7.2.2"

page 205 line 23 insert new subclause

"149B.4.2.2 Counters RX_FRAME Defined in 149.3.7.2.6"

**Proposed Response**

**Response Status:** W

**PROPOSED ACCEPT IN PRINCIPLE.**

The subclause 149B.4.2.2 already exists. RX_FRAME is not a Counter but a message.

P205 L16 insert new variable definition, with appropriate formatting, " rf_valid -> Defined in 149.3.7.2.2"

P205 L 23 insert new subclause, with appropriate formatting,

"149B.4.2.3 Messages -> RX_FRAME -> Defined in 149.3.7.2.6"
In multiport designs, there is confusion as to whether port-to-port crosstalk in the MDI or on the board are governed by the "coupling between link segments" (alien crosstalk) specified in the main clause. They are not. MDI to MDI coupling or trace to trace coupling are in addition. In general, they should be less than or equal to the alien crosstalk specification.

**Suggested Remedy**

Insert 149.C.5 after 149C.4.3, entitled: Coupling between ports on multiport designs, with text: "When multiple MultiGBASE-T1 PHYs are implemented on the same board, care should be taken to avoid coupling between ports. The coupling between adjacent ports on a multiport MDI connector or between adjacent traces is recommended to be approximately the same level, but no greater, than that specified for power sum alien near end crosstalk specified in Equation 149-25."

Additionally, add a second paragraph to 149.7.2, page 172 line 42, to read "For implementations with multiple MultiGBASE-T1 ports on the same MDI connector assembly, coupling between ports on the MDI connector is not considered to be part of the PSANEXT and PSAFEXT specification. For further information, see 149.C.5."

**Proposed Response**

PROPOSED ACCEPT IN PRINCIPLE.

At the end of the proposal "specification" should be "specifications" and remove specific types of crosstalk and replace with alien crosstalk.

Insert 149.C.5 after 149C.4.3, entitled: Coupling between ports on multiport designs, with text: "When multiple MultiGBASE-T1 PHYs are implemented on the same board, care should be taken to avoid coupling between ports. The coupling between adjacent ports on a multiport MDI connector or between adjacent traces is recommended to be approximately the same level, but no greater, than that specified for power sum alien near end crosstalk specified in Equation 149-25."

Additionally, add a second paragraph to 149.7.2, page 172 line 42, to read "For implementations with multiple MultiGBASE-T1 ports on the same MDI connector assembly, coupling between ports on the MDI connector is not considered to be part of the alien crosstalk specifications. For further information, see 149.C.5."