

IEEE P802.3cu D3.0 100 Gb/s per wavelength on SMF Initial Sponsor ballot comments

CI **FM** SC **FM** P12 L20 # I-1  
 Lewis, Jon Dell EMC  
 Comment Type **E** Comment Status **X**  
 IEEE Std 802.3ch has been published.  
 SuggestedRemedy  
 Change "IEEE Std 802.3ch™-20xx" to "IEEE Std 802.3ch™-2020"  
 Proposed Response Response Status **O**

CI **FM** SC **FM** P12 L28 # I-4  
 Lewis, Jon Dell EMC  
 Comment Type **E** Comment Status **X**  
 Amendment number is missing  
 SuggestedRemedy  
 Add "Amendment 9 --" where "--" is an em-dash  
 Proposed Response Response Status **O**

CI **FM** SC **FM** P12 L38 # I-2  
 Lewis, Jon Dell EMC  
 Comment Type **E** Comment Status **X**  
 IEEE Std 802.3cr is currently ahead of P802.3cu in the publication order but is missing from the list of ammendments.  
 SuggestedRemedy  
 Add "IEEE Std 802.3cr™-20xx  
 This amendment includes changes to IEEE Std 802.3-2018 and adds Annex J. This amendment replaces references to the IEC 60950 series of standards (including IEC 60950-1 "Information technology equipment—Safety—Part 1: General requirements") with appropriate references to the IEC 62368 "Audio/video, information and communication technology equipment" series and makes appropriate changes to the standard corresponding to the new references."  
 Proposed Response Response Status **O**

CI **00** SC **0** P12 L20 # I-5  
 Maguire, Valerie The Siemon Company  
 Comment Type **E** Comment Status **X**  
 802.3ch has published.  
 SuggestedRemedy  
 Replace, "802.3ch-20xx" with, "802.3cg-2020" and insert "Amendment 8—" before "This amendment..." on line 22  
 Proposed Response Response Status **O**

CI **00** SC **0** P12 L28 # I-6  
 Maguire, Valerie The Siemon Company  
 Comment Type **E** Comment Status **X**  
 Missing some template text.  
 SuggestedRemedy  
 Insert "Amendment 9—" before "This amendment...".  
 Proposed Response Response Status **O**

CI **FM** SC **FM** P12 L22 # I-3  
 Lewis, Jon Dell EMC  
 Comment Type **E** Comment Status **X**  
 Amendment number is missing  
 SuggestedRemedy  
 Add "Amendment 8 --" where "--" is an em-dash  
 Proposed Response Response Status **O**

CI **FM** SC **FM** P1 L10 # I-7  
 Grow, Robert RMG Consulting  
 Comment Type **E** Comment Status **X**  
 I think Mr. Law has assigned this project an amendment number.  
 SuggestedRemedy  
 Amendment 11  
 Proposed Response Response Status **O**

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Cl **FM** SC **FM** P1 L30 # I-8  
 Grow, Robert RMG Consulting  
 Comment Type **E** Comment Status **X**  
 IEEE Std 802.3ch-2020 is now published. P802.3cr has been assigned amendment number 10.  
 SuggestedRemedy  
 Change "IEEE Std 802.3ch-20xx" to "IEEE Std 802.3ch-2020". Add "IEEE Std 802.3cr-20xx" to the end of the list and appropriately move the "and".  
 Proposed Response Response Status **O**

Cl **FM** SC **FM** P3 L5 # I-9  
 Grow, Robert RMG Consulting  
 Comment Type **E** Comment Status **X**  
 Per the 802.3 list of terms, "Energy-Efficient Ethernet" should be hyphenated.  
 SuggestedRemedy  
 "Energy-Efficient Ethernet". Also fix on p. 63, lines 38 and 47.  
 Proposed Response Response Status **O**

Cl **FM** SC **FM** P1 L31 # I-10  
 Grow, Robert RMG Consulting  
 Comment Type **E** Comment Status **X**  
 PHY is not the acronym for Physical Layer, it is the acronym for Physical Layer Device.  
 SuggestedRemedy  
 Delete "(PHY)".  
 Proposed Response Response Status **O**

Cl **FM** SC **FM** P3 L1 # I-11  
 Grow, Robert RMG Consulting  
 Comment Type **E** Comment Status **X**  
 PHY is not the acronym for Physical Layer, it is the acronym for Physical Layer Device.  
 SuggestedRemedy  
 Delete "(PHY)".  
 Proposed Response Response Status **O**

Cl **FM** SC **FM** P12 L20 # I-12  
 Grow, Robert RMG Consulting  
 Comment Type **E** Comment Status **X**  
 This amendment is no published.  
 SuggestedRemedy  
 Change "IEEE Std 802.3ch-20xx" to "IEEE Std 802.3ch-2020".  
 Proposed Response Response Status **O**

Cl **FM** SC **FM** P12 L22 # I-13  
 Grow, Robert RMG Consulting  
 Comment Type **E** Comment Status **X**  
 This amendment has a number.  
 SuggestedRemedy  
 Insert "Amendment 8 --".  
 Proposed Response Response Status **O**

Cl **FM** SC **FM** P12 L26 # I-14  
 Grow, Robert RMG Consulting  
 Comment Type **E** Comment Status **X**  
 Until published, the reference year should be incomplete.  
 SuggestedRemedy  
 Change "2020" to "20xx".  
 Proposed Response Response Status **O**

## IEEE P802.3cu D3.0 100 Gb/s per wavelength on SMF Initial Sponsor ballot comments

Cl **FM** SC **FM** P**12** L**28** # **I-15**  
 Grow, Robert RMG Consulting  
 Comment Type **E** Comment Status **X**  
 This amendment has a number.  
 SuggestedRemedy  
 Insert "Amendment 9 --".  
 Proposed Response Response Status **O**

Cl **FM** SC **FM** P**12** L**37** # **I-16**  
 Grow, Robert RMG Consulting  
 Comment Type **E** Comment Status **X**  
 Because this draft references Annex J2 (151.9.1), IEEE Std 802.3cr needs to precede this project in amendment number because it adds the Annex. And, P802.3cr has been assigned Amendment 10.  
 SuggestedRemedy  
 IEEE Std 802.3crTM-20xx Amendment 10 -- This amendment includes changes to IEEE Std 802.3-2018 and adds Annex J. This amendment replaces references to the IEC 60950 series of standards (including IEC 60950-1 "Information technology equipment—Safety—Part 1: General requirements") with appropriate references to the IEC 62368 "Audio/video, information and communication technology equipment" series and makes appropriate changes to the standard corresponding to the new references This amendment includes changes to IEEE Std 802.3-2018 and adds Annex J. This amendment replaces references to the IEC 60950 series of standards (including IEC 60950-1 "Information technology equipment—Safety—Part 1: General requirements") with appropriate references to the IEC 62368 "Audio/video, information and communication technology equipment" series and makes appropriate changes to the standard corresponding to the new references.  
 Proposed Response Response Status **O**

Cl **140** SC **140.8.1** P**52** L**38** # **I-17**  
 Grow, Robert RMG Consulting  
 Comment Type **T** Comment Status **X**  
 This subclause has no text.  
 SuggestedRemedy  
 Delete the heading.  
 Proposed Response Response Status **O**

Cl **140** SC **140.6** P**40** L**16** # **I-22**  
 Dudek, Michael Marvell  
 Comment Type **TR** Comment Status **X**  
 In 140.10a.1 there are requirements for interoperation for the output power as well as the channel loss. This should be stated here.  
 SuggestedRemedy  
 Change "channel requirements" to "Channel and 100GBASE-FR1 transmitter average power requirements."  
 Proposed Response Response Status **O**

Cl **140** SC **140.6.1** P**42** L**32** # **I-23**  
 Dudek, Michael Marvell  
 Comment Type **E** Comment Status **X**  
 It does not say at what point the figure and text should be inserted.  
 SuggestedRemedy  
 Add "at the end of section 140.6.1"  
 Proposed Response Response Status **O**

Cl **140** SC **140.6.2** P**43** L**32** # **I-24**  
 Dudek, Michael Marvell  
 Comment Type **E** Comment Status **X**  
 It does not say at what point the figure and text should be inserted.  
 SuggestedRemedy  
 Add "at the end of section 140.6.2"  
 Proposed Response Response Status **O**

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Cl 140 SC 140.6.2 P44 L18 # I-25  
 Dudek, Michael Marvell  
 Comment Type T Comment Status X  
 There is an erroneous footnote reference "e" on the receiver sensitivity row. (These aren't test conditions).  
 SuggestedRemedy  
 Delete the footnote reference  
 Proposed Response Response Status O

Cl 140 SC 140.6.3 P46 L32 # I-26  
 Dudek, Michael Marvell  
 Comment Type E Comment Status X  
 It does not say at what point the figure and text should be inserted.  
 SuggestedRemedy  
 Add "at the end of section 140.6.3"  
 Proposed Response Response Status O

Cl 140 SC 140.7.5a P50 L7 # I-27  
 Dudek, Michael Marvell  
 Comment Type T Comment Status X  
 There is only one lane for these Phys  
 SuggestedRemedy  
 Delete "of each lane"  
 Proposed Response Response Status O

Cl 140 SC 140.7.10 P52 L23 # I-28  
 Dudek, Michael Marvell  
 Comment Type T Comment Status X  
 The RINx does not have to meet the requirements for all of the Phys just the one being tested.  
 SuggestedRemedy  
 Change "for 100GBASE-DR, 100GBASE-FR1, and 100GBASE-LR1." to "for the PHY under test"  
 Proposed Response Response Status O

Cl 140 SC 140.7.10 P52 L35 # I-29  
 Dudek, Michael Marvell  
 Comment Type TR Comment Status X  
 The overshoot/undershoot for the FR1/LR1 transmitters is limited. Testing a receiver with more than this would over-stress it.  
 SuggestedRemedy  
 Add an additional bullet. "For 100GBASE-FR1 and 100GBASE-LR1 the transmitter over/undershoot does not exceed the value specified in table 140-6 for the PHY under test".  
 Proposed Response Response Status O

Cl 151 SC 151.7.3 P75 L21 # I-30  
 Dudek, Michael Marvell  
 Comment Type E Comment Status X  
 Footnotes "a" and "b" only differ by the name of the Phy. It would be better to combine them.  
 SuggestedRemedy  
 Make a single footnote referenced from the parameter column. Footnote to say "The channel insertion loss is calculated using the maximum distance specified in Table 151-6 and fiber attenuation of 0.5 dB/km plus an allocation for connection and splice loss given in 151.11.2.1"  
 Proposed Response Response Status O

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Cl 151 SC 151.8.5 P79 L40 # I-31  
 Dudek, Michael Marvell  
 Comment Type T Comment Status X  
 The bandwidth is not equivalent to any reference receiver. It is the specific reference receiver for that PHY.  
 SuggestedRemedy  
 Change "equivalent to a reference receiver" to "equivalent to that of the reference receiver"  
 Proposed Response Response Status O

Cl 151 SC 151.13.4.2 P93 L18 # I-34  
 Dudek, Michael Marvell  
 Comment Type E Comment Status X  
 The value/comment is wrong.  
 SuggestedRemedy  
 Change "local fault" to "receive fault"  
 Proposed Response Response Status O

Cl 151 SC 151.11.2.1 P88 L29 # I-32  
 Dudek, Michael Marvell  
 Comment Type T Comment Status X  
 There is 1.3dB additional insertion loss allowed in the LR4-6 budget (table 151-9). It would be good to point out that this can be used for additional connection loss.  
 SuggestedRemedy  
 Insert an extra sentence after the example sentence. Sentence to say. "The additional insertion can also be allocated to connection loss resulting in a total connection loss of 3.3dB."  
 Proposed Response Response Status O

Cl 140 SC 140.10a P56 L45 # I-35  
 Lewis, David Lumentum Inc.  
 Comment Type T Comment Status X  
 Interoperation between PMDs is not a requirement. This information should be informative to advise those who might want to interoperate between different PMDs.  
 SuggestedRemedy  
 In the headings for 140.10a, 140.10a.1, 140.10a.2 and 140.10a.3 change "Requirements for interoperation..." to "Informative guidance for interoperation...". Change the captions for Tables 140-15 and 140-16 from "Channel insertion loss requirements..." to "Channel insertion loss ranges...".  
 Proposed Response Response Status O

Cl 151 SC 151.13.4.2 P93 L15 # I-33  
 Dudek, Michael Marvell  
 Comment Type E Comment Status X  
 The value/comment is wrong.  
 SuggestedRemedy  
 Change "local fault" to "transmit fault"  
 Proposed Response Response Status O

Cl 151 SC 151.12 P89 L34 # I-36  
 Lewis, David Lumentum Inc.  
 Comment Type T Comment Status X  
 Interoperation between PMDs is not a requirement. This information should be informative to advise those who might want to interoperate between different PMDs.  
 SuggestedRemedy  
 In the heading for 151.12 change "Requirements for interoperation..." to "Informative guidance for interoperation...". Change the captions for Tables 151-16 from "Channel insertion loss requirements..." to "Channel insertion loss ranges...".  
 Proposed Response Response Status O

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CI 140 SC 140.7.5 P49 L42 # I-37

Lewis, David Lumentum Inc.

Comment Type T Comment Status X

There are no reference channels for TDECQ testing of 100GBASE-FR1 or 100GBASE-LR1 at the linked locations (121.8.5.2).

SuggestedRemedy

Change text from "...measured using the methods specified in 121.8.5.1, 121.8.5.2, and 121.8.5.3.." to "...measured using the methods specified in 121.8.5.1, 121.8.5.2 for 100GBASE-DR only, and 121.8.5.3....". Insert a new paragraph before 140.7.5.1: "100GBASE-FR1 and 100GBASE-LR1 transmitters are tested using optical channels that meet the requirements in Table 140-10a. Insert the new Table 140-10a in the same format as Table 151-12 but with PMD types 400GBASE-FR4 replaced by 100GBASE-FR1 and 400GBASE-LR4-6 replaced by 100GBASE-LR1. Change the coefficient values for minimum and maximum dispersion of 100GBASE-LR1 from 0.138 to 0.23. Change footnotes with editorial license.

Proposed Response Response Status O

CI 151 SC 151.3.2 P65 L36 # I-38

Lewis, David Lumentum Inc.

Comment Type E Comment Status X

The use of the word must is deprecated and cannot be used when stating mandatory requirements, must is used only to describe unavoidable situations.

SuggestedRemedy

change "must be kept within limits" to "shall be kept within limits".

Proposed Response Response Status O

CI 151 SC 151.10 P87 L42 # I-39

Lewis, David Lumentum Inc.

Comment Type E Comment Status X

The use of the word must is deprecated and cannot be used when stating mandatory requirements, must is used only to describe unavoidable situations.

SuggestedRemedy

In footnote c, change must to shall.

Proposed Response Response Status O

CI 151 SC 151.5.4 P68 L30 # I-40

Lewis, David Lumentum Inc.

Comment Type E Comment Status X

The use of the word must is deprecated and cannot be used when stating mandatory requirements, must is used only to describe unavoidable situations.

SuggestedRemedy

change "implementations must " to "implementations should"

Proposed Response Response Status O

CI 140 SC 140.9 P54 L23 # I-41

Lewis, David Lumentum Inc.

Comment Type E Comment Status X

The use of the word must is deprecated and cannot be used when stating mandatory requirements, must is used only to describe unavoidable situations.

SuggestedRemedy

In footnote c, change "system must tolerate" to "system shall tolerate"

Proposed Response Response Status O

CI 151 SC 151.1 P63 L40 # I-42

Lewis, David Lumentum Inc.

Comment Type E Comment Status X

The use of the word must is deprecated and cannot be used when stating mandatory requirements, must is used only to describe unavoidable situations.

SuggestedRemedy

In footnote a, change must to shall.

Proposed Response Response Status O

IEEE P802.3cu D3.0 100 Gb/s per wavelength on SMF Initial Sponsor ballot comments

Cl 140 SC 140.1 P37 L34 # I-43

Lewis, David Lumentum Inc.

Comment Type E Comment Status X

The use of the word must is deprecated and cannot be used when stating mandatory requirements, must is used only to describe unavoidable situations.

SuggestedRemedy

In footnote a, change must to shall.

Proposed Response Response Status O

Cl 140 SC 140.6.1 P42 L28 # I-44

Lewis, David Lumentum Inc.

Comment Type E Comment Status X

The use of the word must is deprecated and cannot be used when stating mandatory requirements, must is used only to describe unavoidable situations.

SuggestedRemedy

In footnote b, change must to shall.

Proposed Response Response Status O

Cl 151 SC 151.9.4 P86 L22 # I-45

Lewis, David Lumentum Inc.

Comment Type E Comment Status X

The use of will is deprecated and cannot be used when stating mandatory requirements, will is only used in statements of fact

SuggestedRemedy

Change "will be met" to "are met"

Proposed Response Response Status O

Cl 151 SC 151.4 P66 L51 # I-46

Lewis, David Lumentum Inc.

Comment Type E Comment Status X

The use of will is deprecated and cannot be used when stating mandatory requirements, will is only used in statements of fact

SuggestedRemedy

change "these test points will not typically be accessible" to "these test points are not typically accessible"

Proposed Response Response Status O

Cl 140 SC 140.7.5 P49 L37 # I-47

Maki, Jeffery Juniper Networks, Inc.

Comment Type TR Comment Status X

No subclause appears or external-subclause addition appears for "Channel requirements" including a table providing "Transmitter compliance channel specifications" for 100GBASE-FR1 and 100GBASE-LR1.

SuggestedRemedy

Add subclause or insert external-subclause addition for "Channel requirements" including a table providing "Transmitter compliance channel specifications" for 100GBASE-FR1 and 100GBASE-LR1.

Proposed Response Response Status O

Cl 140 SC 140.6 P45 L15 # I-48

Zhang, Bo Inphi Corporation

Comment Type E Comment Status X

Y axis is listed as OMA\_outer (dBm) whereas the Figure and the sub-section is on Rx sensitivity

SuggestedRemedy

Suggest change the Y axis to Receiver Sensitivity.

This proposed change also applies to page 51 (Fig 140-5), and page 74 (Fig 151-4).

Proposed Response Response Status O

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Cl 140 SC 140.7.5 P49 L44 # I-49

Zhang, Bo Inphi Corporation

Comment Type T Comment Status X

This paragraph ended with and incomplete phrase, 'with the following exceptions:'

*SuggestedRemedy*

Suggest complete the exception if any or remove this phrase at the end of this paragraph in section 140.7.5 Transmitter and dispersion eye closure for PAM4 (TDECQ).

Proposed Response Response Status O

Cl 30 SC 30.5.1.1.2 P19 L12 # I-50

Ran, Adeo Intel

Comment Type E Comment Status X

According to the style manual (18.2.2):

"Change shall be used when text or tables are being modified; therefore, strikethrough (for deletions) and underscore (for insertions) should be indicated"  
and  
"Insert shall be used to add new text, equations, tables, or figures in the standard".

Here an existing subclause is being modified, not a new one inserted.

*SuggestedRemedy*

Change the instructions to "change" (3 times) and underline the new text.

Proposed Response Response Status O

Cl 78 SC 78.7.4 P24 L7 # I-51

Ran, Adeo Intel

Comment Type E Comment Status X

According to the style manual (18.2.2):

"Change shall be used when text or tables are being modified; therefore, strikethrough (for deletions) and underscore (for insertions) should be indicated"  
and  
"Insert shall be used to add new text, equations, tables, or figures in the standard".

Here an existing table is being modified, not a new one inserted.

Also in the following places, page/subclause/Line:

- 25 80.1.4 14
- 26 80.4 42
- 32 116.1.3 18
- 33 116.4 38

*SuggestedRemedy*

Change the instruction to "change" and underline the new text. Apply in all listed places.

Proposed Response Response Status O

Cl 140 SC 140.1 P38 L1 # I-52

Ran, Adeo Intel

Comment Type E Comment Status X

According to the style manual (18.2.2):

"Change shall be used when text or tables are being modified; therefore, strikethrough (for deletions) and underscore (for insertions) should be indicated"  
and  
"Insert shall be used to add new text, equations, tables, or figures in the standard".

Here a figure is being repalced and its title is changed (the "change" instruction can't be applied to a figure).

*SuggestedRemedy*

Change the instruction to "replace" the figure and "change" the title. Remove the underlines in the figure.

Proposed Response Response Status O



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Cl 140 SC 140.6.1 P42 L32 # I-53  
 Ran, Adees Intel  
 Comment Type E Comment Status X  
 Where are the new table and text inserted?  
 SuggestedRemedy  
 Add to the instruction "after Table 140-6" or wherever it is intended.  
 Proposed Response Response Status O

Cl 140 SC 140.7.9 P51 L26 # I-56  
 Ran, Adees Intel  
 Comment Type E Comment Status X  
 Is Figure 140-5 a new figure, a replacement, or no change to existing figure 140-5?  
 SuggestedRemedy  
 If no change, separate the editorial instruction to two changes, before and after the figure.  
 Proposed Response Response Status O

Cl 140 SC 140.6.2 P43 L38 # I-54  
 Ran, Adees Intel  
 Comment Type E Comment Status X  
 Where are the new figure and text inserted?  
 In the next page, Table 140-7 is changed but there is no corresponding editorial instruction.  
 SuggestedRemedy  
 Change the instruction to "change" and include context to identify the location of the new text. Add "insert" instruction for the figure.  
 Proposed Response Response Status O

Cl 151 SC 151.5.4 P68 L10 # I-57  
 Huber, Thomas Nokia  
 Comment Type E Comment Status X  
 The paragraph above Table 151-4 and the final paragraph of clause 151.5.4 (two paragraphs below the table) are both providing additional information on how to interpret the information in the table. It would be better to combine these into a single paragraph, above the table.  
 SuggestedRemedy  
 Change the paragraph above Table 151-4 to read as shown below (inserting the contents of the last paragraph as the third sentence), and delete the last paragraph in clause 151.5.4.

Cl 140 SC 140.6.3 P46 L43 # I-55  
 Ran, Adees Intel  
 Comment Type E Comment Status X  
 Where are the new figures and text inserted?  
 SuggestedRemedy  
 Add to the instruction "after Table 140-8" or wherever it is intended.  
 Add the numbers of the new figures, 140-2c and 140-2d.  
 Proposed Response Response Status O

SIGNAL\_DETECT shall be a global indicator of the presence of optical signals on all four lanes. The value of the SIGNAL\_DETECT parameter shall be generated according to the conditions defined in Table 151-4.  
 Various implementations of the Signal Detect function are permitted by this standard, including implementations that generate the SIGNAL\_DETECT parameter values in response to the amplitude of the modulation of the optical signal and implementations that respond to the average optical power of the modulated optical signal. The PMD receiver is not required to verify whether a compliant 400GBASE-R signal is being received. This standard imposes no response time requirements on the generation of the  
 Proposed Response Response Status O

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Cl **FM** SC **FM** P**12** L**20** # **I-58**  
 Trowbridge, Stephen Nokia  
 Comment Type **E** Comment Status **X**  
 P802.3ch has been published  
 SuggestedRemedy  
 Change IEEE Std 802.3chTM-20xx to IEEE Std 802.3chTM-2020  
 Proposed Response Response Status **O**

Cl **140** SC **140.6.3** P**46** L**46** # **I-59**  
 Stassar, Peter Huawei Technologies Co. Ltd  
 Comment Type **E** Comment Status **X**  
 The clarification of Figures 140-2c and 140-2d are insufficient to make the reader understand the relationship between these figures and the illustrative power budget in Table 140-8. Also applies to new Clause 151, subclause 151.7.3.  
 SuggestedRemedy  
 The clarification needs to be expanded. A presentation with specific text proposals will be submitted to the relevant comment resolution meeting(s).  
 Proposed Response Response Status **O**

Cl **140** SC **140.6.1** P**41** L**32** # **I-60**  
 Sommers, Scott Molex Incorporated  
 Comment Type **T** Comment Status **X**  
 In Table 140-6; change the contents for "Wavelength (range)" from "1304.5 to 1317.5" to "1300 to 1320". Reason: To enable uncooled DFB laser application for industrial temperature operation.  
 SuggestedRemedy  
 1300 to 1320  
 Proposed Response Response Status **O**

Cl **140** SC **140.6.2** P**44** L**9** # **I-61**  
 Sommers, Scott Molex Incorporated  
 Comment Type **T** Comment Status **X**  
 In Table 140-7; change the contents for "Wavelength (range)" from "1304.5 to 1317.5" to "1300 to 1320". Reason: To enable uncooled DFB laser application for industrial temperature operation.  
 SuggestedRemedy  
 1300 to 1320  
 Proposed Response Response Status **O**

Cl **140** SC **140.9** P**54** L**21** # **I-62**  
 Sommers, Scott Molex Incorporated  
 Comment Type **T** Comment Status **X**  
 In the note b for Table 140-11, change note b," b Over the wavelength range 1304.5 to 1317.5 to 1300-1320. Reason: To enable uncooled DFB laser application for industrial temperature operation.  
 SuggestedRemedy  
 1300 to 1320  
 Proposed Response Response Status **O**

Cl **140** SC **140.6.1** P**41** L**37** # **I-63**  
 Dawe, Piers J G Mellanox Technologies  
 Comment Type **TR** Comment Status **X**  
 100GBASE-DR and 100GBASE-FR1 are expected to be interoperable (whether this standard says so or not). So the 100GBASE-FR1 transmitter must not be weaker than the 100GBASE-DR one. It's not worth making a special case for 0.2 dB that most transmitters can't use anyway, without super-high extinction ratio.  
 SuggestedRemedy  
 Change 100GBASE-FR1 average launch power (min) from -3.1 to -2.9, same as for 100GBASE-DR. As a consequence, change average receive power (min) from -7.1 to -6.9 dBm.  
 In 140.10a.1, delete "and the 100GBASE-FR1 transmitter average power is greater than or equal to the value for average launch power (min) for 100GBASE-DR in Table 140-6."  
 Proposed Response Response Status **O**

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Cl 140 SC 140.6.1 P41 L51 # I-64

Dawe, Piers J G Mellanox Technologies

Comment Type TR Comment Status X

The receiver must be protected from over-emphasised very bad signals as in all other optical PAM4 clauses, 400ZR and 100GBASE-ZR. Over/under-shoot and peak-to-peak power don't exclude all of these (but if you believe they do, the K limit won't hurt you).

SuggestedRemedy

Limit TDECQ -  $10\log_{10}(\text{Ceq})$  and TECQ -  $10\log_{10}(\text{Ceq})$  for 100GBASE-FR1 and 100GBASE-LR1 to 3.4 dB.

As there's now no need to generate such bad signals for Rx stress test or test the receiver against them, in Table 140-7 Conditions of stressed receiver sensitivity test, add limits for SECQ -  $10\log_{10}(\text{Ceq})$  (max) of 3.4 dB.

Remove the inserted wording in 140.7.5 and 5th item in list in 140.7.10. Similarly for 400GBASE-FR4 400GBASE-LR4-6.

Proposed Response Response Status O

Cl 140 SC 140.6.1 P42 L7 # I-65

Dawe, Piers J G Mellanox Technologies

Comment Type TR Comment Status X

100GBASE-DR and 100GBASE-FR1 are interoperable. So the 100GBASE-FR1 transmitter must not transmit a worse signal than the 100GBASE-DR one.

SuggestedRemedy

Limit TECQ -  $10\log_{10}(\text{Ceq})$  for 100GBASE-FR1 to 3.4 dB.

Proposed Response Response Status O

Cl 140 SC 140.6.1 P42 L8 # I-66

Dawe, Piers J G Mellanox Technologies

Comment Type TR Comment Status X

I can see that  $| \text{TDECQ} - \text{TECQ} |$  (max) limits sort-of dispersion penalty, but as we can't expect that the minimum penalty is at zero dispersion, it doesn't tell us the sensitivity to dispersion after a long link. Also, I would prefer a transmitter with low back-to-back penalty than one with high penalty at each dispersion - at least it's good somewhere. This spec rejects mediocre but acceptable transmitters simply because they are good when used back-to-back, which is silly.

SuggestedRemedy

Delete the " $| \text{TDECQ} - \text{TECQ} |$  (max)" row. Similarly for 400GBASE-FR4 400GBASE-LR4-6.

Proposed Response Response Status O

Cl 140 SC 140.6.1 P42 L14 # I-67

Dawe, Piers J G Mellanox Technologies

Comment Type TR Comment Status X

The transmitter transition time (max) is probably ineffective: only the most exceptional signals could pass this and fail TDECQ. But an effective spec usefully protects the receiver against ultra-slow signals that are hard to receive.

SuggestedRemedy

Change 17 ps to 16 ps for for 100GBASE-FR1 and 100GBASE-LR1. Similarly for 400GBASE-FR4 400GBASE-LR4-6.

Proposed Response Response Status O

Cl 140 SC 140.6.1 P42 L17 # I-68

Dawe, Piers J G Mellanox Technologies

Comment Type T Comment Status X

The transmitter peak-to-peak power (max) limits are 0.8 and 0.5 dB above the max OMA limits. As these PMDs may be used back-to-back with zero loss, this impacts receiver design.

SuggestedRemedy

Consider reducing these, particularly for 100GBASE-LR1, by a couple of tenths of a dB.

Proposed Response Response Status O

IEEE P802.3cu D3.0 100 Gb/s per wavelength on SMF Initial Sponsor ballot comments

Cl 140 SC 140.6.1 P42 L25 # I-69

Dawe, Piers J G Mellanox Technologies

Comment Type T Comment Status X

This note "Average launch power (min) is informative and not the principal indicator of signal strength" dates back to when OMA was new and unfamiliar. Part of it is contrary to the style manual: not allowed to mix informative and normative in a table, although it's grandfathered in. Depending on the exact values, it may be technically wrong, and there was no need to say it anyway.

*SuggestedRemedy*

Change to just "Average launch power (min) is not the principal indicator of signal strength".  
Same in Table 151-7 (Tx).

Proposed Response Response Status O

Cl 140 SC 140.6.1 P43 L21 # I-70

Dawe, Piers J G Mellanox Technologies

Comment Type T Comment Status X

I wonder if putting the knee at 1.4 dB is a bit high, these days? This applies more to 100GBASE-FR1 where the dispersion penalty might be small.

*SuggestedRemedy*

Consider moving the knee to 1.2 dB by reducing the minimum OMA. If wished, the Average launch power (min) for 100GBASE-LR1 could be reduced in step.

Proposed Response Response Status O

Cl 140 SC 140.6.3 P46 L34 # I-71

Dawe, Piers J G Mellanox Technologies

Comment Type T Comment Status X

Wordsmithing for clarity and accuracy: change:  
a The channel insertion loss is calculated using the maximum distance specified in Table 140-5 for 100GBASE-DR and 100GBASE-FR1 and cabled optical fiber attenuation of 0.5 dB/km plus an allocation for connection and splice loss given in 140.10.2.1.  
b The channel insertion loss is calculated using the maximum distance specified in Table 140-5 for 100GBASE-LR1 and fiber attenuation of 0.43 dB/km at 1304.5 nm plus an allocation for connection and splice loss given in 140.10.2.1.

*SuggestedRemedy*

To:  
a The channel insertion losses for 100GBASE-DR and 100GBASE-FR1 are calculated using the maximum distances specified in Table 140-5 and cabled optical fiber attenuation of 0.5 dB/km plus an allocation for connection and splice loss given in 140.10.2.1.  
b The channel insertion loss for 100GBASE-LR1 is calculated using the maximum distance specified in Table 140-5 and fiber attenuation of 0.43 dB/km at 1304.5 nm plus an allocation for connection and splice loss given in 140.10.2.1.

Proposed Response Response Status O

Cl 140 SC 140.7.5a P50 L8 # I-72

Dawe, Piers J G Mellanox Technologies

Comment Type TR Comment Status X

Never write "shall be measured" in 802.3; it's not a test spec. Use the standard form of words.

*SuggestedRemedy*

The TECQ of each lane shall be within the limits given in Table 140-6 for 100GBASE-FR1 and 100GBASE-LR1 if measured measured using the methods specified for TDECQ in 140.7.5, except that the test fiber is not used. The test pattern specified for TECQ is given in Table 140-10.  
Similarly in 151.8.6.

Proposed Response Response Status O

IEEE P802.3cu D3.0 100 Gb/s per wavelength on SMF Initial Sponsor ballot comments

Cl 140 SC 140.7.5b P50 L10 # I-73

Dawe, Piers J G Mellanox Technologies

Comment Type T Comment Status X

Misleading name: "Transmitter over/under-shoot"

SuggestedRemedy

Change to "Signal over/under-shoot" or "Relative over/under-shoot" or "Over/under-shoot". Also in 151.

Proposed Response Response Status O

Cl 140 SC 140.7.5b P50 L13 # I-74

Dawe, Piers J G Mellanox Technologies

Comment Type T Comment Status X

percentage

SuggestedRemedy

Delete: we don't say TDECQ decibellage. The % is in the table. Calling it "relative overshoot" makes the point another way. Similarly in 151.8.9 if it remains.

Proposed Response Response Status O

Cl 140 SC 140.7.5b P50 L20 # I-75

Dawe, Piers J G Mellanox Technologies

Comment Type T Comment Status X

Wordsmithing: change:  
Transmitter overshoot is defined as the maximum power from the transmitter (Pmax) relative to the level 3 power and the transmitter OMAouter according to:

SuggestedRemedy

to:  
Signal overshoot is defined as the maximum power (Pmax) of a signal above the level 3 power and relative to the signal's OMAouter according to:  
Similarly for undershoot. Same in 151.8.9 if it remains.

Proposed Response Response Status O

Cl 140 SC 140.7.5b P50 L31 # I-76

Dawe, Piers J G Mellanox Technologies

Comment Type T Comment Status X

A 1% hit ratio is very lax, much different to the spec SER. This isn't the same situation as a traditional mask hit ratio.

SuggestedRemedy

Determine what correlates to receiver performance. If appropriate, change to 1e-3, with corresponding change to the limit (see rodes\_3cu\_01a\_052620 for measurements on one particular build standard). Use explicit scope noise loading to get consistent results with strong and weak signals.  
Same in 151.8.9 if it remains.

Proposed Response Response Status O

Cl 140 SC 140.7.5c P50 L45 # I-77

Dawe, Piers J G Mellanox Technologies

Comment Type T Comment Status X

Misleading name: "Transmitter peak-to-peak power"

SuggestedRemedy

Change to "Signal peak-to-peak power" or "Peak-to-peak power" (or see another comment). Also in 151.

Proposed Response Response Status O

Cl 140 SC 140.7.5c P50 L50 # I-78

Dawe, Piers J G Mellanox Technologies

Comment Type T Comment Status X

For 100GBASE-LR1, the combination of the loss in a long channel and the over/under-shoot limit means that limiting peak-to-peak power at TP3 may be unnecessary. For 100GBASE-FR1, the loss might be only 0.6 dB.

SuggestedRemedy

Consider not requiring compliance to peak-to-peak power for 100GBASE-LR1 at TP3. For 100GBASE-FR1, adjust the measured result by the adding the loss of the test channel and subtracting 0.5 dB. It may be easier to create separate entries and limits for peak-to-peak power for 100GBASE-LR1 at TP2 and at TP3.

Proposed Response Response Status O

IEEE P802.3cu D3.0 100 Gb/s per wavelength on SMF Initial Sponsor ballot comments

Cl 140 SC 140.7.5c P50 L52 # I-79

Dawe, Piers J G Mellanox Technologies

Comment Type TR Comment Status X

The positive and negative peaks of an optical signal can be very different. An obvious example is a directly modulated laser, but other transmitters are not symmetric also, and chromatic dispersion can make this worse. An optical receiver copes with positive and negative excursions from the mean and needs protection from both extremes; the positive and negative peaks must be limited separately.

SuggestedRemedy

Change "Transmitter peak-to-peak power" which is Pmax - Pmin to "Transmitter power excursion", defined as max(Pmax-Paverage, Paverage-Pmin). Take 3 dB off the limits in Table 140-6.

Or, define "effective peak-to-peak power" as 2\*max(Pmax-Paverage, Paverage-Pmin). Make similar changes in Clause 151.

Proposed Response Response Status O

Cl 140 SC 140.7.9 P51 L15 # I-80

Dawe, Piers J G Mellanox Technologies

Comment Type TR Comment Status X

Here, the penalty in the signal for RS testing is called SECQ, while in 140.6.3 and p52 line 7 it's TECQ. Rule says use the same name for the same thing, every time.

SuggestedRemedy

Options are:  
Change to SECQ to align with base document. Consider repurposing SECQ to "signal eye closure (quaternary)"; or  
Define ECQ "eye closure (quaternary)" for general use including when it's not necessarily of transmitted signal at TP2 (TECQ), dispersed signal at TP3 (TDECQ), or stressed signal at TP3 (SECQ).

Adjust 151 for consistency.

Proposed Response Response Status O

Cl 140 SC 140.7.10 P52 L35 # I-81

Dawe, Piers J G Mellanox Technologies

Comment Type T Comment Status X

Do we need to say that the stressed receiver conformance test signal obeys the rules for over/under-shoot and peak-to-peak power (if applicable)?

SuggestedRemedy

Add another item to the list saying so.

Also in 151.8.13.2.

Proposed Response Response Status O

Cl 140 SC 140.10.1 P55 L20 # I-82

Dawe, Piers J G Mellanox Technologies

Comment Type E Comment Status X

Tidy up

SuggestedRemedy

Make the table full width. Also Table 151-14.

Proposed Response Response Status O

Cl 151 SC 151.5.4 P68 L22 # I-83

Dawe, Piers J G Mellanox Technologies

Comment Type T Comment Status X

There is no average receive power, each lane (min) in Table 151-8 for 400GBASE-FR4 and 400GBASE-LR4-6. There's one for each.

SuggestedRemedy

Either delete "for 400GBASE-FR4 and 400GBASE-LR4-6" (as Table 140-4) or change "and" to "or" and modify Table 140-4.

Proposed Response Response Status O

IEEE P802.3cu D3.0 100 Gb/s per wavelength on SMF Initial Sponsor ballot comments

CI 151 SC 151.7.1 P71 L23 # I-84  
 Dawe, Piers J G Mellanox Technologies  
 Comment Type T Comment Status X  
 The difference in launch power between any two lanes is limited to 4 dB here, while the rows above limit it to 3.9 or 4.1 dB.  
 SuggestedRemedy  
 Delete the row or tighten the limit e.g to 3 dB. Adjust the receive table in step.  
 Proposed Response Response Status O

CI 151 SC 151.8.9 P82 L26 # I-87  
 Dawe, Piers J G Mellanox Technologies  
 Comment Type T Comment Status X  
 Too much duplication of over/under-shoot method.  
 SuggestedRemedy  
 Delete from line 31 and say it is analogous to 140.7.5b.  
 Proposed Response Response Status O

CI 151 SC 151.8.4 P79 L11 # I-85  
 Dawe, Piers J G Mellanox Technologies  
 Comment Type T Comment Status X  
 Apart from the first two sentences, this is identical to 122.8.4.  
 SuggestedRemedy  
 Remove all but the first two sentences; refer to 122.8.4.  
 Proposed Response Response Status O

CI 151 SC 151.8.9 P82 L26 # I-88  
 Dawe, Piers J G Mellanox Technologies  
 Comment Type ER Comment Status X  
 Put the subclauses in 151.8 the same order as in 140.7 (following D2.1 comment 65) and the same order as in the Tx and Rx tables. But, because we now have several specs derived from the same measured waveform, more than in previous projects, it's time to group them all together.  
 SuggestedRemedy  
 In the Tx tables (140-6 and 151-7):  
 TDECQ  
 TDECQ - 10log10(Ceq)  
 TECQ  
 | TDECQ - TECQ | if it remains  
 Transmitter over/under-shoot  
 Transmitter peak-to-peak power  
 Transmitter transition time  
 Average launch power of OFF transmitter \*OR\* Extinction ratio  
 In the Definition of optical parameters and measurement methods, e.g.:  
 151.8.5 Transmitter and dispersion eye closure for PAM4 (TDECQ)  
 151.8.6 Transmitter eye closure for PAM4 (TECQ)  
 151.8.7 Transmitter over/under-shoot  
 151.8.8 Transmitter peak-to-peak power  
 151.8.9 Transmitter transition time  
 151.8.10 Extinction ratio  
 Proposed Response Response Status O

CI 00 SC 122.8.4 P79 L36 # I-86  
 Dawe, Piers J G Mellanox Technologies  
 Comment Type T Comment Status X  
 Too much duplication of established TDECQ method. Also, contradictory: says specified in 121.8.5.1, 121.8.5.2, and 121.8.5.3 then repeats it all below.  
 SuggestedRemedy  
 Remove the duplicate material.  
 Proposed Response Response Status O

IEEE P802.3cu D3.0 100 Gb/s per wavelength on SMF Initial Sponsor ballot comments

Cl 151 SC 151.8.10 P83 L11 # I-89

Dawe, Piers J G Mellanox Technologies

Comment Type T Comment Status X

The combination of the loss in a long channel and the over/under-shoot limit means that the peak-to-peak power at TP3 has to be at least ~0.6 dB or ~1.8 dB less than at TP2.

SuggestedRemedy

For 400GBASE-FR4, adjust the measured result by the adding the loss of the test channel and subtracting 0.5 dB.

For 400GBASE-LR4, adjust the measured result by the adding the loss of the test channel and subtracting 1.5 dB.

It may be easier to create separate entries and limits for peak-to-peak power at TP2 and at TP3.

Proposed Response Response Status O

Cl 151 SC 151.8.13 P83 L43 # I-90

Dawe, Piers J G Mellanox Technologies

Comment Type T Comment Status X

Too much duplication of stressed receiver sensitivity method. Figure wastes the reader's time - is it identical to Figure 122-8, if not what differs?

SuggestedRemedy

Define 151's SRS by reference to 121 and 122, in the style of 140.7.10.

Proposed Response Response Status O

Cl 140 SC 140.6.3 P46 L21 # I-91

Cole, Christopher R II-VI

Comment Type E Comment Status X

The inclusion of a section reference in Table 140-8 for "Maximum discrete reflectance" for 100GBASE-FR1 and 100GBASE-LR1 is cumbersome to use and inconsistent with changes that the 802.3cu working group made in 802.3cu D2.2 to remove similar references in other tables. Also in Table 140-14 in section 140.10.2.2 (page 56), having the units along side the values within the table, rather than as a separate "units column", is inconsistent with practice throughout the rest of the document.

Similar comments against Table 151-9 (page 75) and Table 151-15 (page 89) in Clause 151.

This topic was discussed during the 802.3cu ad-hoc conference call on 14 August 2020, in conjunction with presentation [https://www.ieee802.org/3/cu/public/cu\\_adhoc/cu\\_archive/cole\\_3cu\\_adhoc\\_081420\\_v2.pdf](https://www.ieee802.org/3/cu/public/cu_adhoc/cu_archive/cole_3cu_adhoc_081420_v2.pdf).

SuggestedRemedy

Implement the proposed changes to Table 140-8, Table 140-14, Table 151-9 and Table 151-15, and associated footnotes, as captured in [https://www.ieee802.org/3/cu/public/cu\\_adhoc/cu\\_archive/cole\\_3cu\\_adhoc\\_081420\\_v2.pdf](https://www.ieee802.org/3/cu/public/cu_adhoc/cu_archive/cole_3cu_adhoc_081420_v2.pdf).

Proposed Response Response Status O

Cl 00 SC 0 P0 L # I-92

Nicholl, Gary Cisco Systems, Inc.

Comment Type E Comment Status X

Implement new FM template (Version 4.3)

SuggestedRemedy

Implement new FM template (Version 4.3), based the email from Pete Anslow to the 802.3\_EDITORS reflector on 7/6/2020

Proposed Response Response Status O



IEEE P802.3cu D3.0 100 Gb/s per wavelength on SMF Initial Sponsor ballot comments

Cl 151 SC 151.8.10 P83 L10 # I-93

Rodes, Roberto

II-VI

Comment Type T Comment Status X

There is no reason to spec Transmitter peak-to-peak over fiber. Peak-to-peak power over fiber will always be lower than back to back. It creates confusion for people using the specs.

*SuggestedRemedy*

Replace text:

Transmitter peak-to-peak power is measured using the waveforms captured for the TDECQ test (see 151.8.5) and the waveform captured for the TECQ test (see 151.8.6), but without the reference equalizer being applied in each case.

With:

Transmitter peak-to-peak power is measured using the waveform captured for the TECQ test (see 151.8.6), but without the reference equalizer being applied in each case.

Proposed Response Response Status O

Cl 140 SC 140.7.5c P50 L49 # I-94

Rodes, Roberto

II-VI

Comment Type T Comment Status X

There is no reason to spec Transmitter peak-to-peak over fiber. Peak-to-peak power over fiber will always be lower than back to back. It creates confusion for people using the specs.

*SuggestedRemedy*

Replace text:

Transmitter peak-to-peak power is measured using the waveform captured for the TECQ test (see 140.7.5a), but without the reference equalizer being applied in each case.

With:

Transmitter peak-to-peak power is measured using the waveforms captured for the TDECQ test (see 140.7.5) and the waveform captured for the TECQ test (see 140.7.5a), but without the reference equalizer being applied in each case.

Proposed Response Response Status O

Cl 151 SC 151.7.1 P71 L15 # I-95

Rodes, Roberto

II-VI

Comment Type T Comment Status X

FR4 and LR4-6 spec on 'Average launch power, each lane (max)' constrains effective Tx OMA range.

This is an unnecessary constrain since receivers overload is mainly affected by max OMA, not AOP.

Even FR1 and LR1 spec, with the same Rx technology and no Rx demux loss, have higher maximum AOP spec.

This flexibility in AOP will be especially important to achieve uncooled operation.

We recommend increasing spec 'Average launch power, each lane (max)' to 0.7 dB higher than spec 'Outer Optical Modulation Amplitude (OMA<sub>outer</sub>), each lane (max)'

With this change, the effective maximum OMA per lane is maintained for extinction ratios of 4dB and higher.

*SuggestedRemedy*

Change spec on 'Average launch power, each lane (max)' to 4.4dB for FR4 and 5.1dB for LR4-6

Same changes to Average receive power, each lane (max).

Proposed Response Response Status O