*Cl* **1** *SC* **1** *P* **17** *L* **16** # 1

Wienckowski, Natalie General Motors

*Comment Type* **E** *Comment Status* **D** *bucket*

The "important Notice" is no longer required according to IEEE.

*SuggestedRemedy*

Delete lines 16 through 26: IMPORTANT NOTICE: IEEE Standards documents are not intended to ensure safety, health, or environmental protection, or ensure against interference with or from other devices or networks. Implementers of IEEE Standards documents are responsible for determining and complying with all appropriate safety, security, environmental, health, and interference protection practices and all applicable laws and
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http://standards.ieee.org/IPR/disclaimers.html

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

PROPOSED ACCEPT.

*Cl* **FM** *SC* **FM** *P* **12** *L* **1** # 2

Wienckowski, Natalie General Motors

*Comment Type* **E** *Comment Status* **D** *bucket*

802.3cg was approved in 2019

*SuggestedRemedy*

Change 20xx to 2019

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

PROPOSED ACCEPT.

*Cl* **45** *SC* **45.2.1.7.4** *P* **20** *L* **51** # 3

Wienckowski, Natalie General Motors

*Comment Type* **E** *Comment Status* **D** *bucket*

Because you are showing a new row in the same table you are changing a row in, the text in the new row should be underlined to clearly show that this is new.

*SuggestedRemedy*

Underline all text in the last row of the table, including the cross-reference.

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

PROPOSED ACCEPT.

*Cl* **45** *SC* **45.2.1.7.5** *P* **21** *L* **15** # 4

Wienckowski, Natalie General Motors

*Comment Type* **E** *Comment Status* **D** *bucket*

Because you are showing a new row in the same table you are changing a row in, the text in the new row should be underlined to clearly show that this is new.

*SuggestedRemedy*

Underline all text in the last row of the table, including the cross-reference.

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

PROPOSED ACCEPT.

*Cl* **45** *SC* **45.2.1.8** *P* **21** *L* **34** # 5

Wienckowski, Natalie General Motors

*Comment Type* **E** *Comment Status* **D** *bucket*

Because you are showing a new row in the same table you are changing a row in, the text in the new row should be underlined to clearly show that this is new.

*SuggestedRemedy*

Underline all text in the last row of the table, including the cross-reference.

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

PROPOSED ACCEPT.

*Cl* **116** *SC* **116.1.4** *P* **33** *L* **28** # 6

Wienckowski, Natalie General Motors

*Comment Type* **E** *Comment Status* **D** *bucket*

All M's and O's in the 400GBASE-FR4 and 400GBASE-LR4-6 rows should be underlined as these are added text.

*SuggestedRemedy*

Add underlined as defined in the comment.

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

PROPOSED ACCEPT.

*Cl* **116** *SC* **116.1.4** *P* **33** *L* **10** # 7

Wienckowski, Natalie General Motors

*Comment Type* **E** *Comment Status* **D** *bucket*

Straddle the two Clause 151 labels to be in a single cell as is done for 117. (This should be done for 122 as well.)

*SuggestedRemedy*

Make the change defined in the comment.

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

PROPOSED ACCEPT.

*Cl* **140** *SC* **140.7.11** *P* **46** *L* **36** # 8

Wienckowski, Natalie General Motors

*Comment Type* **TR** *Comment Status* **A** *Tx overshoot*

There should not be a note that text is needed in a WG draft.

*SuggestedRemedy*

Remove the note: Editor's Note: We need some text to describe the test method.

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

ACCEPT IN PRINCIPLE.

See comment #47

*Cl* **151** *SC* **151.8.12** *P* **73** *L* **45** # 9

Wienckowski, Natalie General Motors

*Comment Type* **TR** *Comment Status* **A** *Tx overshoot*

There should not be a note that text is needed in a WG draft.

*SuggestedRemedy*

Remove the note: Editor's Note: We need some text to describe the test method.

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

ACCEPT IN PRINCIPLE.

See comment #47

*Cl* **00** *SC* **0** *P* **12** *L* **1** # 10

Lewis, Jon Dell EMC

*Comment Type* **E** *Comment Status* **D** *bucket*

IEEE Std 802.3cg-20xx should be 2019.

*SuggestedRemedy*

Change 20xx to 2019

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

PROPOSED ACCEPT.

*Cl* **140** *SC* **140.6.2** *P* **42** *L* **11** # 11

Lewis, Jon — Dell EMC

*Comment Type* **E** *Comment Status* **D** *bucket3*

"defined in Table 140-7 per the definitions in 140.7." This just reads oddly given that the Table number and the subsequent clause are the same (140-7 and 140.7). It took me a moment to realize that the definitions weren't in the Table but in the clause 140.7.

*SuggestedRemedy*

Change "defined in Table 140-7 per the definitions in 140.7." to "defined in Table 140-7 per the definitions in clause 140.7."

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

PROPOSED REJECT.

140.7 is subclause and not a clause.

The current text is consistent with the IEEE style manual and with convention used consistently throughout the draft.

Section 11.1 of the 2014 IEEE-SA Standards Style Manual (https://development.standards.ieee.org/myproject/Public/mytools/draft/styleman.pdf) states the following:

“The terms clause or subclause should not be used in headings or references except when referring to major clause headings (e.g., “see Clause 5”) or at the beginning of a sentence. All other cross-references should be made by simply referring to the number (e.g., “see 5.1”).”

*Cl* **151** *SC* **151.9.1** *P* **73** *L* **52** # 12

Lewis, Jon — Dell EMC

*Comment Type* **T** *Comment Status* **D** *Bucket*

P802.3cr has centralized the general safety references in Annex J. P802.3cr is in a recirculation WG ballot and is likely to complete prior to P802.3cu. TF Chairs should discuss the order of the amendments as that would determine if this change should happen in P802.3cu or P802.3cr.

*SuggestedRemedy*

Change "All equipment subject to this clause shall conform to IEC 60950-1." to "All equipment subject to this clause shall conform to the general safety requirements as specified in J.2". Add Editor's Note to be removed prior to SA ballot to align text with changes to P802.3cr.

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

PROPOSED ACCEPT.

*Cl* **151** *SC* **151.13.4.6** *P* **83** *L* **6** # 13

Lewis, Jon — Dell EMC

*Comment Type* **T** *Comment Status* **D** *Bucket*

If Annex J is inserted in 151.9.1 then the PICs needs to be updated also.

*SuggestedRemedy*

Change "Conforms to IEC 60950-1" to "Conforms to J.2"

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

PROPOSED ACCEPT.

*Cl* **151** *SC* **151.9.1** *P* **73** *L* **52** # 14

Carlson, Steven — HSD/Bosch/Ethernovia

*Comment Type* **TR** *Comment Status* **D** *Bucket*

P802.3cr is harmonizing general safety references across all of IEEE 802.3 in Annex J. P802.3cr is in the 1st WG ballot recirculation and is likely to complete the ballot cycle prior to P802.3cu. Coordination between TFs and the P802.3cr project should be maintained to keep this material in sync.

*SuggestedRemedy*

Change "All equipment subject to this clause shall conform to IEC 60950-1." to "All equipment subject to this clause shall conform to the general safety requirements as specified in J.2". Add Editor's Note to be removed prior to SA ballot to align text with changes to P802.3cr.

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

PROPOSED ACCEPT.

*Cl* **151** *SC* **151.13.4.6** *P* **83** *L* **6** # 15

Carlson, Steven — HSD/Bosch/Ethernovia

*Comment Type* **TR** *Comment Status* **D** *Bucket*

If Annex J is inserted in 151.9.1 then the PICs require updating.

*SuggestedRemedy*

Change "Conforms to IEC 60950-1" to "Conforms to J.2"

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

PROPOSED ACCEPT.

*Cl* **140** *SC* **140.7.11** *P* **46** *L* **36** # 16

Carlson, Steven HSD/Bosch/Ethernovia

*Comment Type* **TR** *Comment Status* **A** *Tx overshoot*

There should not be a note that technical text is needed in a WG draft. This text should have been present in D2.0.

*SuggestedRemedy*

Remove: Editor's Note: We need some text to describe the test method.

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

ACCEPT IN PRINCIPLE.

See comment #47

*Cl* **151** *SC* **151.8.12** *P* **73** *L* **45** # 17

Carlson, Steven HSD/Bosch/Ethernovia

*Comment Type* **TR** *Comment Status* **A** *Tx overshoot*

There should not be a note that technical text is needed in a WG draft. This text should have been present in D2.0.

*SuggestedRemedy*

Remove: Editor's Note: We need some text to describe the test method.

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

ACCEPT IN PRINCIPLE.

See comment #47

*Cl* **151** *SC* **151.5.4** *P* **59** *L* **53** # 18

Brown, Matt Huawei Technologies Canada

*Comment Type* **TR** *Comment Status* **D** *Bucket*

The reference should be to 151.2 rather than 116.3. It is correct that 116.3 provides the default architecture, 151.2 points to 116.3 and provides additional information for mapping SIGNAL_DETECT.

*SuggestedRemedy*

Change the reference to "161.3" to "151.2".

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

PROPOSED ACCEPT IN PRINCIPLE.

Change reference from "116.3" to "151.2".

*Cl* **151** *SC* **151.7.1** *P* **63** *L* **47** # 19

Brown, Matt Huawei Technologies Canada

*Comment Type* **TR** *Comment Status* **A** *Tx OMA*

For footnote "b", what is the significance of "even if"? Are there other cases where it should? I suspect that the intention is that the OMA_outer is supposed to be met over a range of ER and TDECQ.

*SuggestedRemedy*

Explain more completely what the intent for meeting OMA_outer is.

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

ACCEPT IN PRINCIPLE.

Remove footnote "b" in Table 151-7.

*Cl* **151** *SC* **151.7.2** *P* **64** *L* **3** # 20

Brown, Matt Huawei Technologies Canada

*Comment Type* **T** *Comment Status* **D** *Bucket*

The specifications are not defined in Table 151-8, they are listed there; the specifications are defined within subclause 151.8.

*SuggestedRemedy*

Delete "defined" twice.

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

PROPOSED ACCEPT.

*Cl* **151** *SC* **151.7.2** *P* **64** *L* **42** # 21

Brown, Matt Huawei Technologies Canada

*Comment Type* **TR** *Comment Status* **D** *withdrawn*

The intent of footnote b is unclear. The referencing row is average receive power minimum, each lane, whereas the footnote talks about Receiver Sensitivity (OMA_outer). Perhaps the footnote should be moved down a row. Even then its not clear. Does it then mean that the values in the row above must be met for SECQ less than 1.4 dB, but then the values the reference equations (which also defined RS) are used?

*SuggestedRemedy*

Move the location of the footnote reference if it makes sense. Reword footnote to provide a bit more clarity for the whole specification of RS.

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

PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **151** *SC* **151.8.5.1** *P* **67** *L* **50** # 22

Brown, Matt — Huawei Technologies Canada

*Comment Type* **E** *Comment Status* **D** *withdrawn*

The acronym RIN has not been defined in the Clause.

*SuggestedRemedy*

Change "RIN" to "relative intensity noise (RIN)".

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

PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **151** *SC* **151.8.5.1** *P* **69** *L* **7** # 23

Brown, Matt — Huawei Technologies Canada

*Comment Type* **E** *Comment Status* **D** *withdrawn*

The acronym DGD has not been defined in the Clause.

*SuggestedRemedy*

Change "DGD" to "differential group delay (DGD)".

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

PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **151** *SC* **151.8.5.4** *P* **68** *L* **28** # 24

Brown, Matt — Huawei Technologies Canada

*Comment Type* **E** *Comment Status* **D** *bucket2*

In figure 151-4, Insconsistent font type and size.

*SuggestedRemedy*

Change all to Arial 8pt.

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

PROPOSED ACCEPT IN PRINCIPLE.

The commenter meant Figure 151-5 on page 69 and line 33 and not Figure 151-4.

Change all text in Figure 151-5 to Arial 8pt.

*Cl* **151** *SC* **151.8.5.4** *P* **72** *L* **28** # 25

Brown, Matt — Huawei Technologies Canada

*Comment Type* **E** *Comment Status* **D** *Bucket*

In figure 151-7, insconsistent font type and size.

*SuggestedRemedy*

Change all to Arial 8pt.

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

PROPOSED ACCEPT IN PRINCIPLE.
Most of the font in figure 151-7 is Arial 9pt. One text block is Arial 10pt (Stress conditioning), and another is Arial 8pt (Pattern trigger). Propose to change all to Arial 9pt.

*Cl* **116** *SC* **116.1.4** *P* **33** *L* **28** # 26

Brown, Matt — Huawei Technologies Canada

*Comment Type* **E** *Comment Status* **D** *bucket*

The "O" and "M" for new rows must be underline.

*SuggestedRemedy*

Underline all text in new rows for 400GBASE-FR4 and 400GBASE-LR4-6.

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

PROPOSED ACCEPT.

*Cl* **140** *SC* **140** *P* **36** *L* **7** # 27

Brown, Matt — Huawei Technologies Canada

*Comment Type* **E** *Comment Status* **D** *Bucket*

This is not an editing instruction, but this information is normally part of an editing instruction.

*SuggestedRemedy*

Delete "Clause 140 was added to IEEE Std 802.3-2018 by IEEE Std 803.3cd-2018".
Change instruction at top of page to: "Change the title of Clause 140 (as inserted by IEEE Std 802.3cd-2018) as follows".

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

PROPOSED ACCEPT.

*Cl* **140** *SC* **140.1** *P* **36** *L* **15** # 28

Brown, Matt — Huawei Technologies Canada

*Comment Type* **E** *Comment Status* **D** *Bucket*

The word "three" here is not necessary. For future amendments, let's avoid unecessary words that might have to be revised in the future.

*SuggestedRemedy*

Delete "three".

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

PROPOSED ACCEPT.

*Cl* **140** *SC* **140.7.9.** *P* **45** *L* **51** # 29

Brown, Matt — Huawei Technologies Canada

*Comment Type* **TR** *Comment Status* **A** *Rx sensitivity*

This paragraph says that for FR1/LR1 that RS and SRS are normative. Yet the statements above use the word "should" which is associated with an informative specification. The paragraph at line 51, provides no value and should be deleted. Like everywhere else in 802.3, the difference between normative and informative is clear from the wording, "shall" vs "should" or "may". From the standards style manual: "The word should indicates that among several possibilities, one is recommended as particularly suitable without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required (should equals is recommended that)."

*SuggestedRemedy*

Delete the paragraph on page 45 line 51.
If a normative specfication is intended, then change the statements above to normative ("shall") statements.

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

ACCEPT IN PRINCIPLE.

A normative specification is intended for 100GBASE-FR1 and 100GBASE-LR1.

Change "should" to "shall" on page 45, lines 37 and 42.

In the last paragraph of 140.7.9, add the amending formatting.

*Cl* **140** *SC* **140.9** *P* **48** *L* **10** # 30

Brown, Matt — Huawei Technologies Canada

*Comment Type* **T** *Comment Status* **D** *withdrawn*

Wasn't the reach for LR1 reduced to 6 km?

*SuggestedRemedy*

Change "10 000" to "6 000".

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

PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **151** *SC* **151.1** *P* **55** *L* **30** # 31

Brown, Matt — Huawei Technologies Canada

*Comment Type* **E** *Comment Status* **D** *Bucket*

Use proper terminology. See Annexes 120B, 120C, 120D, 120E.

*SuggestedRemedy*

Change as follows.
"Chip-to-chip 400GAUI-16" to "400GAUI-16 C2C"
"Chip-to-module 400GAUI-16" "400GAUI-16 C2M"
"Chip-to-chip 400GAUI-8" to "400GAUI-8 C2C"
"Chip-to-module 400GAUI-8" to "400GAUI-8 C2M"

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

PROPOSED ACCEPT.

*Cl* **151** *SC* **151.7** *P* **62** *L* **23** # 32

Lusted, Kent — Intel

*Comment Type* **TR** *Comment Status* **D** *Bucket*

The references to G.652.B and G652.D are assumed to be ITU-T G.652, 2009 from the base standard because no other version is referenced in this draft specification. However, a newer version of ITU-T G.652 published 2016 makes numerous changes to the SMF specifications that may be relevant to this draft.

*SuggestedRemedy*

Update the Normative Reference in Clause 1.3 from the base specfication (IEEE 802.3-2018) with the updated ITU-T G.652 document.

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

PROPOSED ACCEPT IN PRINCIPLE.

Import subclause 1.3 from 802.3-2018 and:

Replace
ITU-T Recommendation G.652, 2009
with
ITU-T Recommendation G.652, 2016

*Cl* **151** *SC* **151.7** *P* **62** *L* **23** # 33

Lusted, Kent — Intel

*Comment Type* **TR** *Comment Status* **D** *Bucket*

The references to G.657.A1 and G657.A2 are assumed to be ITU-T G.657, 2009 from the base standard because no other version is referenced in this draft specification. However, a newer version of ITU-T G.657 published 2016 makes numerous changes to the SMF specifications that may be relevant to this draft.

*SuggestedRemedy*

Update the Normative Reference in Clause 1.3 from the base specfication (IEEE 802.3-2018) with the updated ITU-T G.657 document.

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

PROPOSED ACCEPT IN PRINCIPLE.

Import subclause 1.3 from 802.3-2018 and:

Replace
ITU-T Recommendation G.657, 2009
with
ITU-T Recommendation G.657, 2016

*Cl* **151** *SC* **151.8.12** *P* **73** *L* **44** # 34

Effenberger, Frank — Futurewei Technologies

*Comment Type* **TR** *Comment Status* **D** *withdrawn*

The test method for overshoot is missing

*SuggestedRemedy*

Replace the editor's note with the material found in the associated supplementary file

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

PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **140** *SC* **140.6.2** *P* **43** *L* **12** # 35

Trowbridge, Steve — Nokia

*Comment Type* **ER** *Comment Status* **D** *Bucket*

Since this is a single-lane interface, there is only one wavelength

*SuggestedRemedy*

Change "Wavelengths (range) to "Wavelength (range)"

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

PROPOSED ACCEPT.

*Cl* **140** *SC* **140.7.11** *P* **46** *L* **36** # 36

Trowbridge, Steve — Nokia

*Comment Type* **TR** *Comment Status* **A** *Tx overshoot*

The editor's note is effectively a TBD that should have been considered lack of technical completeness for moving to WG ballot

*SuggestedRemedy*

Provide the test method for Tx over/under-shoot

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

ACCEPT IN PRINCIPLE.

See comment #47

*Cl* **140** *SC* **140.10b** *P* **51** *L* **14** # 37

Trowbridge, Steve Nokia

*Comment Type* **T** *Comment Status* **A** *Interop*

Is it the case that 100GBASE-FR1 can interoperate with 100GBASE-DR with no extra min/max loss specified?

*SuggestedRemedy*

If FR1/DR can interoperate up to DR reach without needing any extra min/max loss limits, perhaps worth adding a clause 140.10c with a single sentence to say this. Otherwise, add the appropriate min/max loss table.

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

ACCEPT IN PRINCIPLE.
See response to comment #67.

---

*Cl* **151** *SC* **151.8.5** *P* **67** *L* **29** # 38

Trowbridge, Steve Nokia

*Comment Type* **TR** *Comment Status* **A** *Tx 10logCeq*

TDECQ-10log10(Ceq) is not a parameter for any PMD defined in this clause.

*SuggestedRemedy*

Delete ", TDECQ-10log10(Ceq)," from the first sentence of 151.8.5

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

ACCEPT IN PRINCIPLE.

See comment #56

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*Cl* **151** *SC* **151.8.12** *P* **73** *L* **44** # 39

Trowbridge, Steve Nokia

*Comment Type* **TR** *Comment Status* **A** *Tx overshoot*

The editor's note is effectively a TBD that should have been considered lack of technical completeness for moving to WG ballot

*SuggestedRemedy*

Provide the test method for Tx over/under-shoot

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

ACCEPT IN PRINCIPLE.

See comment #47

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*Cl* **151** *SC* **151.13.4.5** *P* **82** *L* **44** # 40

Trowbridge, Steve Nokia

*Comment Type* **TR** *Comment Status* **D** *bucket*

If the over/undershoot measurement mechanism mentioned in a related comment on clause 151.8.12 had been specified, you woud need a PICS to point to it.

*SuggestedRemedy*

Add an OM10 PICS item to this table pointing to the over/undershoot measurement method to be added to 151.8.12.

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

PROPOSED ACCEPT IN PRINCIPLE.

See comment #98.

---

*Cl* **140** *SC* **140.11.4.4** *P* **54** *L* **25** # 41

Trowbridge, Steve Nokia

*Comment Type* **TR** *Comment Status* **D** *bucket*

This table hasn't been incorporated into the P802.3cu draft, however once the missing measurement method in 140.7.11 for over/undershoot is provided, this clause/table should be brought into the draft and an OM10 PICs item should be added to point to 140.7.11.

*SuggestedRemedy*

Bring the table from P802.3cd clause 140.11.4.4 into the draft and add an OM10 PICS item to point to 140.7.11.

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

PROPOSED ACCEPT IN PRINCIPLE.

See comment #91.

*Cl* **80** *SC* **80.1.14** *P* **25** *L* **14** # 42

Trowbridge, Steve Nokia

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

Two paragraphs in 80.1.4 from P802.3ba and P802.3bj (beginning on line 4, page 84, section 6 of IEEE Std 802.3-2018) are confusing when read in the context of new PMDs added by P802.3cd and P802.3cu

*SuggestedRemedy*

Bring into the draft and change the title of Table 80-4 to Nomenclature and clause correlation (100GBASE-R optical). In this way, the two table titles match the classification of the text in the base standard from clause 8.1.4.

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

ACCEPT IN PRINCIPLE.

The sub-clause classification 80.1.14 does not exist. Presume the commenter meant sub-clause 80.1.4 (as referenced in the comment itself).

Implement the suggested remedy.

*Cl* **FM** *SC* **FM** *P* **1** *L* **30** # 43

Marris, Arthur Cadence Design Systems

*Comment Type* **E** *Comment Status* **D** *bucket*

IEEE Std 802.3cm-2020 and 802.3cq-2002 have now been approved

*SuggestedRemedy*

Change 802.3cm-20XX to 802.3cm-2020 and 802.3cq-20XX to 802.3cq-2020 throughout the draft

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

PROPOSED ACCEPT.

*Cl* **FM** *SC* **FM** *P* **12** *L* **1** # 44

Marris, Arthur Cadence Design Systems

*Comment Type* **E** *Comment Status* **D** *bucket*

IEEE Std 802.3cg-2019 has been approved

*SuggestedRemedy*

Change 802.3cg-20XX to 802.3cg-2019 throughout the draft

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

PROPOSED ACCEPT.

*Cl* **116** *SC* **116.1.4** *P* **33** *L* **28** # 45

Marris, Arthur Cadence Design Systems

*Comment Type* **E** *Comment Status* **D** *bucket*

There needs to be more underlining in Table 116-4

*SuggestedRemedy*

Underline the table entries for the new PMDs in Table 116-4

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

PROPOSED ACCEPT.

*Cl* **140** *SC* **140.10.2.2** *P* **49** *L* **45** # 46

Slavick, Jeff Broadcom

*Comment Type* **E** *Comment Status* **D** *Bucket*

Editors direction for modiying the sub-clause is not proper font

*SuggestedRemedy*

Change to proper font for providing directions to the editorial team

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

PROPOSED ACCEPT.

*Cl* **140** *SC* **140.7.11** *P* **46** *L* **36** # 47

Slavick, Jeff — Broadcom

*Comment Type* **TR** *Comment Status* **A** *Tx overshoot*

Editors note states a test method is missing to for checking that a device complies to the over/under shoot requirements.

*SuggestedRemedy*

Add a teset method

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

ACCEPT IN PRINCIPLE.

Based on the results of Straw Polls #2, #3, and #4 taken on the Mar 17 Interim Teleconference the TF consensus was to adopt both relative and absolute Tx overshoot parameters.

Implement the changes in rodes_3cu_01_032420 and in slide 6 of zivny_01_032420, with editorial license.

Straw Poll #2 taken on Mar 17 Interim Teleconference :

I support removing the relative Tx overshoot/undershoot specification:
a) Yes: 10
b) No: 26
(16 Abstain)

Straw Poll #3 taken on Mar 17 Interim Teleconference:

I support the addition of an absolute value for Tx overshoot/undershoot into the specification
a) Yes: 31
b) No: 5
(16 Abstain)

Straw Poll #4 taken on Mar 17 Interim Teleconference:

I support adopting the values proposed in rodes_3cu_01a_0320 (Slide 11) for the relative and absolute Tx overshoot/undershoot
a) Yes: 12
b) No: 3
c) Need more information: 23

*Cl* **151** *SC* **151.8.12** *P* **73** *L* **45** # 48

Slavick, Jeff — Broadcom

*Comment Type* **TR** *Comment Status* **A** *Tx overshoot*

Editors note states a test method is missing to for checking that a device complies to the over/under shoot requirements.

*SuggestedRemedy*

Add a teset method

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

ACCEPT IN PRINCIPLE.

See comment #47

*Cl* **00** *SC* **0** *P* **12** *L* **1** # 49

Maguire, Valerie — The Siemon Company

*Comment Type* **E** *Comment Status* **D** *bucket*

802.3cg has published.

*SuggestedRemedy*

Replace, "802.3cg-20xx" with, "802.3cg-2019"

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

PROPOSED ACCEPT.

*Cl* **151** *SC* **151.5.1** *P* **58** *L* **45** # 50

Maguire, Valerie — The Siemon Company

*Comment Type* **E** *Comment Status* **D** *Bucket*

Extra spaces between paragraphs.

*SuggestedRemedy*

Remove carriage returns on lines 45 and 46.

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

PROPOSED ACCEPT.

*Cl* **151** *SC* **151.11.1** *P* **76** *L* **7** # 51

Maguire, Valerie — The Siemon Company

*Comment Type* **E** *Comment Status* **D** *Bucket*

Extra spaces between paragraphs.

*SuggestedRemedy*

Remove carriage returns on lines 7 and 8.

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

PROPOSED ACCEPT.

*Cl* **140** *SC* **140.6.2** *P* **43** *L* **29** # 52

Bhatt, Vipul — II-VI Incorporated

*Comment Type* **T** *Comment Status* **A** *Rx 10logCeq*

As outlined in http://www.ieee802.org/3/cd/public/July18/king_3cd_02a_0718.pdf, discussed in Dawe and Echeverri-Chac?n cited on http://www.ieee802.org/3/cu/public/Jan20/cole_3cu_01b_0120.pdf#page=10, and expanded in http://www.ieee802.org/3/cu/public/Jan20/cole_3cu_01b_0120.pdf, "TDECQ-10.log(Ceq)" is an indirect and inaccurate indicator of transmitter impairments. Therefore, it fails to accurately indicate how hard the EQ has to work, or its likely resilience to receiver impairments. Similarly "SECQ - 10log10(Ceq)" has the same shortcomings and is not an appropriate condition for defining limits for Stressed Receiver Sensitivity and should be removed. This will align the Recever specifications with Transmitter specifications.

*SuggestedRemedy*

Delete entry for "SECQ - 10log10(Ceq)f (max)" for 100GBASE-FR and 100GBASE-LR in Table 140-7.

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

ACCEPT IN PRINCIPLE.

See comment #56

*Cl* **151** *SC* **151.7.2** *P* **64** *L* **35** # 53

Bhatt, Vipul — II-VI Incorporated

*Comment Type* **T** *Comment Status* **A** *Rx 10logCeq*

As outlined in http://www.ieee802.org/3/cd/public/July18/king_3cd_02a_0718.pdf, discussed in Dawe and Echeverri-Chac?n cited on http://www.ieee802.org/3/cu/public/Jan20/cole_3cu_01b_0120.pdf#page=10, and expanded in http://www.ieee802.org/3/cu/public/Jan20/cole_3cu_01b_0120.pdf, "TDECQ-10.log(Ceq)" is an indirect and inaccurate indicator of transmitter impairments. Therefore, it fails to accurately indicate how hard the EQ has to work, or its likely resilience to receiver impairments. Similarly "SECQ - 10log10(Ceq)" has the same shortcomings and is not an appropriate condition for defining limits for Stressed Receiver Sensitivity and should be removed. This will align the Recever specifications with Transmitter specifications.

*SuggestedRemedy*

Delete row for "SECQ - 10log10(Ceq)f, lane under test (max)" for 400GBASE-FR4 and 100GBASE-LR4-6 in Table 151-8.

Delete "SECQ - 10log10(Ceq) (max), lane under test" in the last bullet item in 151.8.11.2.

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

ACCEPT IN PRINCIPLE.

See comment #56

*Cl* **140** *SC* **140.6** *P* **41** *L* **18** # 54

Maniloff, Eric — Ciena

*Comment Type* **T** *Comment Status* **R** *Tx avg power*

The Average launch power max for 100GBASE-FR1 is calculated for an extinction ratio = ~14 dB. This is inconsistent with 100GBSE-LR1 as well as with 400GBASE-FR4 and 400GBASE-LR4-6, which all use an infinite extinction ratio in this calculation.

*SuggestedRemedy*

Use an infinite extinction ratio to calculate the Average launch power max for 100GBASE-FR1. Replace the value of -2.9 dBm in Table 140-6 with -3.2 dBm

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

REJECT.

The following supporting presentation was submitted, maniloff_3cu_01_040720.

There is merit to investigating this topic but there is concern related to interoperability with 100GBASE-DR. It was also noted that footnotes "a" and "b" in Table 140-6 and footnote "b" in Table 140-7 would need to be changed.

There is no consensus to implement the suggested remedy at this time.

*Cl* **140** *SC* **140.6.3** *P* **44** *L* **16** # 55

Maniloff, Eric Ciena

*Comment Type* **E** *Comment Status* **D** *Bucket*

Channel Insertion loss for 100GBASE-DR is referencing the incorrect sub-clause. The loss for this is in 140.9. Note that 802.3ct had the correct sub-clause referenced for the channel loss for 100GBASE-DR.

*SuggestedRemedy*

Change reference for 100GBASE-DR channel insertion loss to 140.9

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

PROPOSED ACCEPT.

*Cl* **140** *SC* **140.6.2** *P* **43** *L* **28** # 56

Stassar, Peter Huawei

*Comment Type* **TR** *Comment Status* **A** *Rx 10logCeq*

At the January 2020 meeting in Geneva the cu Task Force agreed to delete the entries for "TDECQ - 10log10(Ceq) (max)" in Table 140-6 for 100GBASE-FR & LR.
As outlined in http://www.ieee802.org/3/cd/public/July18/king_3cd_02a_0718.pdf, as summarized in http://www.ieee802.org/3/cu/public/Jan20/cole_3cu_01b_0120.pdf, "TDECQ-10.log(Ceq)" is not a good indicator of how hard the EQ has to work, nor of it's likely resilience to receiver impairments.
Therefore "SECQ - 10log10(Ceq)" is not an appropriate condition for defining limits for Stressed Receiver Sensitivity and should be removed, maintaining consistency with the removal of "TDECQ-10.log(Ceq)" as a metric for transmitter quality.

*SuggestedRemedy*

Delete the entries for "SECQ - 10log10(Ceq)f (max)" for 100GBASE-FR and 100GBASE-LR in Table 140-7.

Additionally copy subclause 140.7.5 in from IEEE Std 802.3cdT-2018, and modify the first sentence "The TDECQ and TDECQ - 10log10(Ceq) shall be within the limits given in Table 140-6..." to "TDECQ shall be within the limits given in Table 140-6...".
This needs to be edited in a way that the original sentence is maintained for 100GBASE-DR.

Also copy subclause 140.7.10 in from IEEE Std 802.3cdT-2018, and modify the before last bullet to:
"The required values of the "Stressed receiver sensitivity (OMAouter) (max)" and "Stressed eye closure for PAM4 (SECQ)" are as given in Table 140-7."
This needs to be edited in a way that the original sentence is maintained for 100GBASE-DR.

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

ACCEPT IN PRINCIPLE.

Based on the results of Straw Poll #1 taken on the 3/17 interim conference call , the Task Force consensus was to maintain the decision made at the 802.3cu TF meeting in Geneva to remove “TDECQ-10Log10(Ceq) and to clean up the draft to correctly reflect this decision (including among other changes to remove “SECQ-10Log10(Ceq)” from the receiver specifications).

Implement the changes in nicholl_3cu_02a_032420

Straw Poll #1:

With regards to the inclusion of TDECQ-10log(Ceq) parameter, I support:
a) Full removal from both Tx and Rx tables: 27
b) Reinstate for both Tx and Rx tables: 9
(17 Abstain)

*Cl* **151** *SC* **151.7.2** *P* **64** *L* **35** # 57

Stassar, Peter Huawei

*Comment Type* **TR** *Comment Status* **A** *Rx 10logCeq*

At the January 2020 meeting in Geneva the cu Task Force agreed to delete the entries for "TDECQ - 10log10(Ceq) (max)" in Table 151-7 for 400GBASE-FR4 & LR4-6.
As outlined in http://www.ieee802.org/3/cd/public/July18/king_3cd_02a_0718.pdf, as summarized in http://www.ieee802.org/3/cu/public/Jan20/cole_3cu_01b_0120.pdf, "TDECQ-10.log(Ceq)" is not a good indicator of how hard the EQ has to work, nor of it's likely resilience to receiver impairments.
Therefore "SECQ - 10log10(Ceq)" is not an appropriate condition for defining limits for Stressed Receiver Sensitivity and should be removed, maintaining consistency with the removal of "TDECQ-10.log(Ceq)" as a metric for transmitter quality.

*SuggestedRemedy*

Delete row for "SECQ - 10log10(Ceq)f, lane under test (max)" for 400GBASE-FR4 and 100GBASE-LR4-6 in Table 151-8.

Additionally delete "SECQ - 10log10(Ceq) (max), lane under test" in the last bullet item in 151.8.11.2.

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

ACCEPT IN PRINCIPLE.

See comment #56

*Cl* **151** *SC* **151.8.5.4** *P* **69** *L* **18** # 58

Dawe, Piers Mellanox

*Comment Type* **TR** *Comment Status* **A** *Tx overshoot*

The 12% overshoot limit means that the largest magnitude tap coefficient minimum of 0.8 specified in 121.8.5.4 is too low. No signal with less than about 0.9 can pass this overshoot spec. Note that 140.7.5.1 is in IEEE Std 802.3cd. If we change this to 0.85, the overshoot limit (if applied at TP3) would bite first. It would be better to tighten this to 0.9 (higher for a better signal).
If in future the overshoot limit is propagated to other PAM4 PMDs in maintenance, the two limits in the proposed sentence could be consolidated again.

*SuggestedRemedy*

In 151.8.5.4 and 140.7.5.1 (in 802.3cd), change:
Tap 1, tap 2, or tap 3 has the largest magnitude tap coefficient, which is constrained to be at least 0.8. to:
Tap 1, tap 2, or tap 3 has the largest magnitude tap coefficient. For 100GBASE-DR, this is constrained to be at least 0.8, and for 100GBASE-FR1 and 100GBASE-LR1, it is constrained to be at least 0.85.

*Response* *Response Status* **U**

ACCEPT IN PRINCIPLE.

See comment #47

*Cl* **151** *SC* **151.7.1** *P* **63** *L* **29** # 59

Dawe, Piers Mellanox

*Comment Type* **TR** *Comment Status* **R** *Tx 10logCeq*

The limit for TDECQ - 10log10(Ceq) (also known as K) has been deleted from this table, but it is still needed to protect the receiver from the bad signals that are not caught by the TDECQ limit or the overshoot limit. All other optical PAM4 transmitter specs have such a limit, which was introduced a long time ago, in July 2018 (P802.3cd/D3.4), and its continued presence is needed to protect equalizers, receivers and receiver designs that were/are designed relying on it. Particularly 400GBASE-LR4-6 where the TDECQ limit is higher than for any existing SMF PMD.

To summarize the situation, we need different limits to exclude different kinds of bad signal: K protects receiver back end, TDECQ protects receiver front end and optical budget, overshoot spec against over-emphasised signals not caught by the other specs, and so on. We need them all, but K and TDECQ come off the same measurement, so not an extra cost.

*SuggestedRemedy*

Restore the limits for TDECQ - 10log10(Ceq) as before (3.4 dB for 400GBASE-FR4 and 3.5 dB for 400GBASE-LR4-6, same as the TDECQ limits).

*Response* *Response Status* **U**

REJECT.

See comment #87

*Cl* **140** *SC* **140.6.1** *P* **41** *L* **34** # 60

Dawe, Piers Mellanox

*Comment Type* **T** *Comment Status* **R** *Tx TECQ*

IEEE Standards Style Manual, 12. Homogeneity:
"The same term should be used throughout each standard or series of standards to designate a given concept. The use of an alternative term (synonym) for a concept already defined should be avoided."
We have established that TECQ and SECQ are the same thing. While "TECQ" (transmitter) is a nice name for a signal measured at TP2, "SECQ" (stressed or signal) works for a signal measured at TP3 also, so it seems that's the one we must choose.

*SuggestedRemedy*

Change "TECQ" to "SECQ" throughout the document. In Table 140-6, "TECQ (max)" could be changed to "SECQ at TP2 (max)", although 140.5.1 and 140.7 make clear that it's at TP2.
In tables 140-10 and 151-11, change "Stressed receiver conformance test signal calibration" to "SECQ".

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

REJECT.

The task force adopted the terminology TECQ as a transmit characteristic in order to distinguish it from SECQ. It is a measured characteristic of a transmitter.

SECQ is a measurement taken on the signal used for testing stressed receiver sensitivity. It is a measured characteristic of a particular source.

*Cl* **151** *SC* **151.8.6** *P* **69** *L* **39** # 61

Dawe, Piers Mellanox

*Comment Type* **T** *Comment Status* **A** *Tx TECQ*

There is a subclause 151.8.6 Transmitter eye closure for PAM4 (TECQ) but no equivalent for Clause 140.

*SuggestedRemedy*

Move this subclause to 140.7.5a (after TDECQ). Refer to it from 151.

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

ACCEPT IN PRINCIPLE.

Insert a new subclause 140.7.5a with a title of "Transmitter eye closure for PAM4 (TECQ)" after subclause 140.7.5 with the following text:

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

*Cl* **151** *SC* **151.7.1** *P* **63** *L* **31** # 62

Dawe, Piers — Mellanox

*Comment Type* **TR** *Comment Status* **R** *Tx 10logCeq*

When limiting TECQ is needed, K(TP2) = TDECQ - 10log10(Ceq) must be limited too.

*SuggestedRemedy*

Under the row for TECQ in Table 140-6, insert a row for TECQ - 10log10(Ceq) (max), with the same limits as for TECQ. Also in Table 151-7.

*Response* *Response Status* **U**

REJECT.

The suggested remedy proposes to add a new transmitter parameter "TECQ -10log10(Ceq) (max)"

This proposal would appear to be counter to the decision made at the January 2020 meeting of the 3cu Task Force in Geneva, to remove a similar parameter "TDECQ - 10log10(Ceq) (max) which was confirmed in Straw Poll #1 taken on the Mar 17 Interim teleconference.

There is no consensus to implement the proposed change.

Straw Poll #1 taken on Mar 17 Interim:

With regards to the inclusion of TDECQ-10log(Ceq) parameter, I support:
a) Full removal from both Tx and Rx tables: 27
b) Reinstate for both Tx and Rx tables: 9
(17 Abstain)

*Cl* **151** *SC* **151.8.6** *P* **69** *L* **39** # 63

Dawe, Piers — Mellanox

*Comment Type* **T** *Comment Status* **R** *Editorial*

There is probably too much material in 151.8 that duplicates 140.7 and possibly 124.8 or 121.8, wasting a careful reader's time. Transmitter transition time is a prime example.

*SuggestedRemedy*

Try to consolidate the definitions as appropriate.

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

REJECT.
The practice in other clauses, such as 138, 139 and 140, has been to duplicate the text of short subclauses and insert the changes needed for the main clause. This avoids readers having to jump around between clauses to find what they are looking for. In the case of longer subclauses, such as the definition of TDECQ, reference is made to the original subclause and text is only duplicated where needed for the clause.

*Cl* **151** *SC* **151.7.1** *P* **63** *L* **37** # 64

Dawe, Piers — Mellanox

*Comment Type* **T** *Comment Status* **D** *Tx transition time*

The transmitter transition time, max 17 ps at TP2, is probably so slow as to be barely effective for a low-dispersion PMD type: it's not far off the slowest that can be made for a 3.4 dB T(D)ECQ limits. If a transmitter is that slow, and significant chromatic dispersion, particularly in 400GBASE-LR4-6, makes the signal at the receiver even slower, it would be slower than any 400GBASE-DR4 or 100GBASE-DR signal could be, yet still pass the higher 3.5 dB TDECQ limit. Any PMD (polarisation mode dispersion) will make this worse. We don't expect that implementers will create equalizer ICs specially for each PMD type; they will be the same as for all 100G/lane, so we should not present them with a new and unnecessary challenge. I doubt that real transmitters are that slow.

If we wanted to contain the problem more precisely, we could introduce a maximum cursor tap limit (part of both TECQ at TP2 and TDECQ at TP3, and could be applied consistently across PMDs).

See http://ieee802.org/3/cn/public/tf_interim/19_0820/dawe_3cn_01_190820.pdf for an earlier report on this issue; halve all the times for 100G/s lanes.

*SuggestedRemedy*

Reduce the transition time limit, to 15 or 16 ps TBD, or introduce a maximum cursor tap limit. The limit (ps or cursor) should be checked with a commercial simulator.

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

PROPOSED REJECT.

A similar comment #i-37, against D3.0 of 802.3cn was rejected based on a review of the presentation linked in this comment. The same technical objections apply in this case:

The transmitter transition time limit was introduced to limit how slow the transmitter could be. The limit for 400GBASE-LR4-6 and 400GBASE-FR4 is the same as for the other 100G/lane PMDs. Consequently, this issue could only arise for a receiver that was designed to rely on the dispersion penalty for the 500 m or 2 km transmitters preventing them from being as slow as the limit and then the dispersion penalty for a 6 km transmitter being significantly lower, allowing the transmitter to be slower. This would be a poor receiver design strategy and is not a sufficiently realistic scenario to justify tightening the transmitter transition time limit for this PMD. The commenter has not provided sufficient evidence to demonstrate that the transmitter transition time is too loose or proposed a specific change to the draft that has been shown to remove that issue

*Cl* **140** *SC* **140.7.11** *P* **46** *L* **30** # 65

Dawe, Piers Mellanox

*Comment Type* **T** *Comment Status* **D** *Bucket*

Don't put the subclause for Transmitter over/under-shoot after the receiver-related subclauses when all other transmitter-related subclauses in 140.7 are before.

*SuggestedRemedy*

Because it's so closely related to T(D)ECQ measurement, put it after Transmitter eye closure for PAM4 (TECQ) and before Extinction ratio.

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

PROPOSED ACCEPT IN PRINCIPLE.

Move subclause 140.7.11 to subclause 140.7.5b after the newly inserted 140.7.5a.

*Cl* **140** *SC* **140.6.1** *P* **41** *L* **26** # 66

Dawe, Piers Mellanox

*Comment Type* **E** *Comment Status* **R** *Tx OMA - TDECQ*

In Table 140-6, transmit characteristics, the four rows for OMA - TDECQ could be combined into three. Doing so will help readers who are designing or testing a transmitter compliant to two columns at the same time. Similarly for the "allocation for penalties" rows in Table 140-8, illustrative link power budgets.

*SuggestedRemedy*

for extinction ratio = 5 dB -2.2 -1.6 -0.4
for 4.5 dB = extinction ratio < 5 dB -1.9 -1.6 -0.4
for extinction ratio < 4.5 dB -1.9 -1.5 -0.3

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

REJECT.

It is not clear that the suggested remedy is an improvment to the clarity of the specification.

With the current layout of Table 140-6 it is clear where the breakout points are for the extinction ratio for each PMD type (i.e. 5dB for 100GBASE-DR, and 4.5dB for 100GBASE-FR1 and 100GBASE-LR1).

*Cl* **140** *SC* **140.10** *P* **50** *L* **35** # 67

Dawe, Piers Mellanox

*Comment Type* **T** *Comment Status* **A** *Interop*

Here, there is guidance for interoperation between 100GBASE-LR1 and 100GBASE-DR, and between 100GBASE-LR1 and 100GBASE-FR1, but not between 100GBASE-FR1 and 100GBASE-DR. Separately, there are statements in 140.6, but 140.6 is not referenced from here, nor are 140.10a and 140.10b referenced from there.

*SuggestedRemedy*

In 140.6, add one cross-reference and update two existing ones:
The 100GBASE-FR1 PMD interoperates with the 100GBASE-DR PMD provided that the channel requirements for 100GBASE-DR are met (see 140.10).
The 100GBASE-LR1 PMD interoperates with the 100GBASE-DR PMD provided that the channel requirements defined in 140.10a.2 are met.
The 100GBASE-LR1 PMD interoperates with the 100GBASE-FR1 PMD provided that the channel requirements defined in 140.10a.3 are met.

Change 140.10a and 140.10b as follows:
140.10a Requirements for interoperation between 100GBASE-DR, 100GBASE-FR1, and 100GBASE-LR1
The 100GBASE-DR, 100GBASE-FR1, and 100GBASE-LR1 PMDs can interoperate with each other as described here.
140.10a.1 Requirements for interoperation between 100GBASE-FR1 and 100GBASE-DR
The 100GBASE-FR1 and 100GBASE-DR PMDs can interoperate with each other provided that the fiber optic cabling (channel) characteristics for 100GBASE-DR (see 140.10) are met.
140.10a.2 Requirements for interoperation between 100GBASE-LR1 and 100GBASE-DR
...for 100GBASE-DR (see140.10) are met, with...
140.10a.3 Requirements for interoperation between 100GBASE-LR1 and 100GBASE-FR1
...for 100GBASE-FR1 (see140.10) are met, with...

For consistency, in 151.12,
...400GBASE-FR4 (see 151.11) are met, with...

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

ACCEPT IN PRINCIPLE.

The need for cross references between 140.6 and 140.10a/b makes sense. However because the tables 140-15 and 140-16 specify min/max channel insertion losses for interoperation, the text of the suggested remedy needs modification.

In 140.6, update the 3 paragraphs starting at line 16 as follows:
The 100GBASE-FR1 PMD interoperates with the 100GBASE-DR PMD provided that the channel requirements for 100GBASE-DR are met (see Table 140-12 and subclause 140.10).
The 100GBASE-LR1 PMD interoperates with the 100GBASE-DR PMD provided that the channel requirements defined in 140.10a.2 are met.

The 100GBASE-LR1 PMD interoperates with the 100GBASE-FR1 PMD provided that the channel requirements defined in 140.10a.3 are met.

Change 140.10a and 140.10b as follows:
140.10a Requirements for interoperation between 100GBASE-DR, 100GBASE-FR1, and 100GBASE-LR1
The 100GBASE-DR, 100GBASE-FR1, and 100GBASE-LR1 PMDs can interoperate with each other as described here.

140.10a.1 Requirements for interoperation between 100GBASE-FR1 and 100GBASE-DR
The 100GBASE-FR1 and 100GBASE-DR PMDs can interoperate with each other provided that the fiber optic cabling (channel) characteristics for 100GBASE-DR (see Table 140-12 and subclause 140.10) are met.

Renumber existing 140.10a to 140.10a.2
add "(see 140.10)" after 100GBASE-DR on 2nd line

Renumber existing 140.10b to 140.10a.3
add "(see 140.10)" after 100GBASE-FR1 on 2nd line

Implement a similar change in clause 151.12 with editorial license.

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*Cl* **140** *SC* **140.6.1** *P* **41** *L* **34** # 68

Dawe, Piers Mellanox

*Comment Type* **TR** *Comment Status* **R** *Tx 10logCeq*

When limiting TECQ is needed, K(TP2) = TDECQ - 10log10(Ceq) must be limited too.

*SuggestedRemedy*

Under the row for TECQ in Table 140-6, insert a row for TECQ - 10log10(Ceq) (max), with the same limits as for TECQ. Also in Table 151-7.

*Response* *Response Status* **U**

REJECT.

See response to comment #62

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*Cl* **140** *SC* **140.6.1** *P* **41** *L* **32** # 69

Dawe, Piers Mellanox

*Comment Type* **TR** *Comment Status* **R** *Tx 10logCeq*

The limit for TDECQ - 10log10(Ceq) (also known as K) is missing from two columns here, but it is still needed to protect the receiver from the bad signals that are not caught by the TDECQ limit or the overshoot limit. All other optical PAM4 transmitter specs have such a limit, which was introduced a long time ago, in July 2018 (P802.3cd/D3.4), and its continued presence is needed to protect equalizers, receivers and receiver designs that were/are designed relying on it.

To summarize the situation, we need different limits to exclude different kinds of bad signal: K protects receiver back end, TDECQ protects receiver front end and optical budget, overshoot spec against over-emphasised signals not caught by the other specs, and so on. We need them all, but K and TDECQ come off the same measurement, so not an extra cost.

*SuggestedRemedy*

Restore the limit for TDECQ - 10log10(Ceq) for 100GBASE-FR1 100GBASE-LR1, as before (3.4 dB, same as the TDECQ limit).

*Response* *Response Status* **U**

REJECT.

See comment #87

*Cl* **140** *SC* **140.7.11** *P* **46** *L* **33** # 70

Dawe, Piers — Mellanox

*Comment Type* **TR** *Comment Status* **A** *Tx overshoot*

We need to agree a measurement method for overshoot, and agree a limit. We should have an idea of what the threat is to design a useful defence, but here is a measurement proposal that at least should give consistent results.
First, notice that limiting overshoot at TP2 is pointless if chromatic dispersion can make it higher at TP3.
Also notice that a measurement on a square wave measures the worst of pre-emphasis and post-emphasis, but a real signal's overshoot can be determined by the sum of these.
This is a bad choice of pattern anyway because PMAs may fail to lock on it and forward the signal correctly to the PMD.
Also notice that traditional peak measurements are distorted by scope noise, particularly for optical scopes at such high bandwidths.

*SuggestedRemedy*

Apply the spec to the same cases as TECQ and TDECQ: TP2, TP3 with most positive chromatic dispersion, and TP3 with most positive chromatic dispersion.
Use the same pattern and observation bandwidth as for T(D)ECQ so that determining the overshoot is another free by-product of measuring for T(D)ECQ, with a much simpler, non-iterative, calculation: in tables 140-10 and 151-11, remove the row for "Transmitter over/under-shoot", and here and in, delete "test pattern specified for transmitter over/under-shoot in Table 140-10".
Find the scope noise.
Create a vertical histogram from the measured waveform (not the equalized one).
Convolve the histogram with the noise that could be added to it at maximum T(D)ECQ, RSS-reduced by the scope noise.
Find the two points where the CDFs come to a number such as 5e-5.
Either find the distance from the "three" level to the upper point, and from the lower point to the "zero" (these are the overshoot and undershoot before normalisation), or find the distance from the average level to the upper point, and from the lower point to the average (these are the peak excursions).
Normalise by either OMA or standard deviation of the waveform. The former is more familiar, the latter avoids the pattern dependency of the OMA definition.
Limit upper and lower separately because excursions on just one side could overload a receiver.
Adjust the limits according to information I haven't seen at time of writing, or insert an editor's note for tables 140-6 and 151-7: "The limit for transmitter over/under-shoot needs confirmation before Standards Association ballot".
Delete most of 151.8.12 but refer to 140.7.11.

*Response* *Response Status* **U**

ACCEPT IN PRINCIPLE.

See comment #47

*Cl* **151** *SC* **151.8.5** *P* **67** *L* **29** # 71

Stassar, Peter — Huawei

*Comment Type* **TR** *Comment Status* **A** *Tx 10logCeq*

Since the agreement at the January 2020 meeting in Geneva to remove the row for "TDECQ - 10log10(Ceq) (max)" in Table 151-7, the inclusion of "TDECQ - 10log10(Ceq)" in the text of subclause 151.8.5 should be removed as well.

*SuggestedRemedy*

Delete "TDECQ - 10log10(Ceq)," in the first sentence of 151.8.5.

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

ACCEPT IN PRINCIPLE.

See comment #56

*Cl* **140** *SC* **140.6.1** *P* **41** *L* **42** # 72

Ingham, Jonathan Broadcom

*Comment Type* **TR** *Comment Status* **R** *Tx overshoot*

The material reviewed by the Task Force in order to justify the introduction of a Tx over/under-shoot limit is merely anecdotal and ultimately unconvincing.
In particular, I refer to cole_3cu_01b_0120, where Tx waveforms at 26.6 GBd (clearly of questionable relevance to this Task Force) are shown to lead to Rx LOL for 13.5% and 19% overshoot. The introduction of a new specification and the associated limit value of 12% on the basis of these isolated examples is the wrong conclusion. The observed LOL can be attributed to the performance of the particular Rx used for the measurements. Some implementers may have an Rx that performs poorly with 5% overshoot in the input waveform, whilst others may have an Rx that performs well with 30% overshoot. To set the limit based on the examples provided in cole_3cu_01b_0120 is inappropriate. In addition, it is not clear how overshoot is defined in this study, again rendering it difficult to justify the setting of a limit based on the results.
Constraining the Tx performance by introducing an additional specification potentially reduces yield and increases cost. Since there is no evidence that a new constraint is required for the PMD specifications under development by this Task Force, the over/under-shoot specification should be removed. 50 GBd PAM4 SMF PMDs have already undergone rigorous qualification and interoperability studies by end users, without the need being identified for any Tx over/under-shoot constraint other than the existing constraint on the largest magnitude tap coefficient in the reference equalizer.
Finally, with the continuing transition to optical interfaces that are reliant on Rx equalization, the interpretation of constraints on features of the TP2 waveform, especially if measured without the reference equalizer, is increasingly uncertain. This applies not only to traditional mask constraints but also to the constraint introduced in this draft. This is why the existing constraint on the largest magnitude tap coefficient in the reference equalizer is a superior method to control over/under-shoot.

*SuggestedRemedy*

In Table 140-6, delete the line with description "Transmitter over/under-shoot (max)". In Table 140-10, delete the line with parameter "Transmitter over/under-shoot". Delete subclause 140.7.11.

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

REJECT.

There is no consensus to implement the suggested remedy.

See comment #47

*Cl* **151** *SC* **151.7.1** *P* **63** *L* **38** # 73

Ingham, Jonathan Broadcom

*Comment Type* **TR** *Comment Status* **R** *Tx overshoot*

The material reviewed by the Task Force in order to justify the introduction of a Tx over/under-shoot limit is merely anecdotal and ultimately unconvincing.
In particular, I refer to cole_3cu_01b_0120, where Tx waveforms at 26.6 GBd (clearly of questionable relevance to this Task Force) are shown to lead to Rx LOL for 13.5% and 19% overshoot. The introduction of a new specification and the associated limit value of 12% on the basis of these isolated examples is the wrong conclusion. The observed LOL can be attributed to the performance of the particular Rx used for the measurements. Some implementers may have an Rx that performs poorly with 5% overshoot in the input waveform, whilst others may have an Rx that performs well with 30% overshoot. To set the limit based on the examples provided in cole_3cu_01b_0120 is inappropriate. In addition, it is not clear how overshoot is defined in this study, again rendering it difficult to justify the setting of a limit based on the results.
Constraining the Tx performance by introducing an additional specification potentially reduces yield and increases cost. Since there is no evidence that a new constraint is required for the PMD specifications under development by this Task Force, the over/under-shoot specification should be removed. 50 GBd PAM4 SMF PMDs have already undergone rigorous qualification and interoperability studies by end users, without the need being identified for any Tx over/under-shoot constraint other than the existing constraint on the largest magnitude tap coefficient in the reference equalizer.
Finally, with the continuing transition to optical interfaces that are reliant on Rx equalization, the interpretation of constraints on features of the TP2 waveform, especially if measured without the reference equalizer, is increasingly uncertain. This applies not only to traditional mask constraints but also to the constraint introduced in this draft. This is why the existing constraint on the largest magnitude tap coefficient in the reference equalizer is a superior method to control over/under-shoot.

*SuggestedRemedy*

In Table 151-7, delete the line with description "Transmitter over/under-shoot (max)". In Table 151-11, delete the line with parameter "Transmitter over/under-shoot". Delete subclause 151.8.12.

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

REJECT.

There is no consensus to implement the suggested remedy.

See comment #47

*Cl* **140** *SC* **140.7.5** *P* **45** *L* **25** # 74

Lewis, David — Lumentum

*Comment Type* **T** *Comment Status* **A** *Tx Ref equalizer*

This subclause in 802.3cd needs to be copied into the draft and modified to include 100GBASE-FR1 and 100GBASE-LR1.

*SuggestedRemedy*

Copy over subclause 140.7.5 from 802.3cd into the draft. Modify the first sentence from "The reference equalizer for 100GBASE-DR is a 5 tap..." to "The reference equalizer is a 5 tap...".

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

ACCEPT.

---

*Cl* **140** *SC* **140.7.1** *P* **45** *L* **2** # 75

Lewis, David — Lumentum

*Comment Type* **T** *Comment Status* **A** *Test patterns*

Need to add TECQ and Receiver sensitivity to Table 140-10.

*SuggestedRemedy*

Add a row: Transmitter eye closure for PAM4 (TECQ), pattern 6, subclause 140.7.12.

Add a row: Receiver sensitivity (OMAouter) (max), pattern 3 or 5, subclause 140.7.9.

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

ACCEPT.

---

*Cl* **140** *SC* **140.7.12** *P* **46** *L* **38** # 76

Lewis, David — Lumentum

*Comment Type* **T** *Comment Status* **A** *Tx TECQ*

Description of TECQ test is missing.

*SuggestedRemedy*

Add a new subclause 140.7.12 Transmitter eye closure for PAM4 (TECQ)

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

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

ACCEPT IN PRINCIPLE.

See comment #61

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*Cl* **151** *SC* **151.7.2** *P* **64** *L* **29** # 77

Lewis, David — Lumentum

*Comment Type* **T** *Comment Status* **A** *Rx sensitivity*

In Table 151-8 the values for Receiver sensitivity (max) only apply for values of SECQ up to 1.4 dB, but receivers need to work with SECQ up to 3.4 dB. The footnote pointing to the relevant equations is convoluted. It would be clearer to revert back to having the equation references in the table and simplifying the footnote.

*SuggestedRemedy*

In Table 151-8 Receiver sensitivity (OMAouter) (max), replace the values of -4.6 and -4.7 with Equation (151-1)and Equation (151-2) respectively.

Change footnote c to: Receiver sensitivity (OMAouter) (max) is defined for a transmitter with a value of SECQ up to 3.4 dB.

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

ACCEPT IN PRINCIPLE.

lewis_3cu_01a_041420 was reviewed.

Implement the changes proposed in lewis_3cu_01a_041420, with editorial license.

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*Cl* **151** *SC* **151.8.10** *P* **70** *L* **35** # 78

Lewis, David — Lumentum

*Comment Type* **T** *Comment Status* **A** *Rx sensitivity*

Since receiver sensitivity is normative, the word "should" needs to be replaced by "shall".

*SuggestedRemedy*

Replace "Receiver sensitivity should meet Equation (1151-1)" with "Receiver sensitivity shall meet Equation (151-1)" on line 35.
Replace "Receiver sensitivity should meet Equation (151-2)" with "Receiver sensitivity shall meet Equation (151-2)" on line 38.

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

ACCEPT.

*Cl* **151** *SC* **151.8.10** *P* **70** *L* **47** # 79

Lewis, David — Lumentum

*Comment Type* **T** *Comment Status* **D** *withdrawn*

The description of RS is not complete.

*SuggestedRemedy*

Replace "is the receiver sensitivity" with "is the receiver sensitivity (OMAouter) (max)", on line 47.

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

PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **151** *SC* **151.8.6** *P* **69** *L* **41** # 80

Lewis, David — Lumentum

*Comment Type* **T** *Comment Status* **D** *Tx TECQ*

For uniformity with the other subclauses in 151.8, we should reference the limits and the test pattern for the test.

*SuggestedRemedy*

Add a sentence at the beginning of the paragraph: "The TECQ of each lane shall be within the limits given in Table 151-7 for 400GBASE-FR4 and 400GBASE-LR4-6 if measured using a test pattern specified for TECQ in Table 151-11.

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

PROPOSED ACCEPT.

*Cl* **151** *SC* **151.8.1** *P* **66** *L* **17** # 81

Lewis, David — Lumentum

*Comment Type* **T** *Comment Status* **A** *Test patterns*

Need entries in Table 151-11 for TECQ and Receiver sensitivity.

*SuggestedRemedy*

Add a row: Transmitter eye closure for PAM4 (TECQ), pattern 6, subclause 151.8.6.

Add a row: Receiver sensitivity (OMAouter) (max), pattern 3 or 5, subclause 151.8.10.

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

ACCEPT.

*Cl* **151** *SC* **151** *P* **55** *L* **1** # 82

Lewis, David — Lumentum

*Comment Type* **TR** *Comment Status* **R** *Reach*

Additional test data is now available and we should revisit the limitation of 400GBASE-LR4-6 to 6 km reach. A supporting presentation will be made.

*SuggestedRemedy*

Change 400GBASE-LR4-6 to 400GBASE-LR4 throughout.
Change 6 km to 10 km in Table 151-6, Table 151-9, footnote a of Table 151-12, Table 151-13, at 1.4.107a, 30.5.1.1.2, Table 116-2, Figure 151-1.
In Table 151-12 change the coefficient from 0.138 to 0.23 for minimum and maximum dispersion of 400GBASE-LR4.

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

REJECT.

Unfortuantely the supporting presentation referenced in the comment was not available.

The following presentations were submitted, chang_3cu_01_033120 and stassar_3cu_01a_041420.

There is no consensus to implement the suggested remedy at this time.

*Cl* **140** *SC* **140.6.2** *P* **43** *L* **21** # 83

Lewis, David — Lumentum

*Comment Type* **T** *Comment Status* **A** *Rx sensitivity*

In Table 140-7 the values for Receiver sensitivity (max) for 100GBASE-FR1 and 100GBASE-LR1 only apply for values of SECQ up to 1.4 dB, but receivers need to work with SECQ up to 3.4 dB. The footnote pointing to the relevant equations is convoluted. It would be clearer to revert back to having the equation references in the table and simplifying the footnote.

*SuggestedRemedy*

In Table 140-7 Receiver sensitivity (OMAouter) (max), replace the values of -4.5 and -6.1 with Equation (140-2)and Equation (140-3) respectively.

Change footnote c to: Receiver sensitivity (OMAouter) (max) for 100GBASE-DR is informative and for 100GBASE-FR1 and 100GBASE-LR1 is normative. It is defined for a transmitter with a value of SECQ up to 3.4 dB.

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

ACCEPT IN PRINCIPLE.

See response to comment #77.

*Cl* **140** *SC* **140.7.9** *P* **45** *L* **37** # 84

Lewis, David — Lumentum

*Comment Type* **T** *Comment Status* **A** *Rx sensitivity*

Since receiver sensitivity is normative for 100GBASE-FR1 and 100GBASE-LR1, the word "should" needs to be replaced by "shall".

*SuggestedRemedy*

Replace "Receiver sensitivity should meet Equation (140-2)" with "Receiver sensitivity shall meet Equation (140-2)" on line 37.
Replace "Receiver sensitivity should meet Equation (140-3)" with "Receiver sensitivity shall meet Equation (140-3)" on line 42.

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

ACCEPT IN PRINCIPLE.

See response to comment #29.

*Cl* **140** *SC* **140.7.9** *P* **45** *L* **47** # 85

Lewis, David — Lumentum

*Comment Type* **T** *Comment Status* **D** *withdrawn*

The description of RS is not complete.

*SuggestedRemedy*

Replace "is the receiver sensitivity" with "is the receiver sensitivity (OMAouter) (max)", on line 47.

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

PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **140** *SC* **140.7.9** *P* **45** *L* **50** # 86

Lewis, David — Lumentum

*Comment Type* **ER** *Comment Status* **D** *Bucket*

There is underlining required in the paragraph at line 50 for changes from the original text in 802.3cd.

*SuggestedRemedy*

Underline "the 100GBASE-DR " and add a strikeout "s" after receiver. Underline all of the second sentence.

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

PROPOSED ACCEPT.

*Cl* **140** *SC* **140.6.1** *P* **41** *L* **32** # 87

Nicholl, Gary — Cisco Systems

*Comment Type* **TR** *Comment Status* **R** *Tx 10logCeq*

TDECQ-10log10(Ceq)(Max) was removed for 100GBASE-FR1 and 100GBASE-LR1 in Table 140-6.

*SuggestedRemedy*

Reinstate TDECQ-10log10(Ceq)(Max) for 100GBASE-FR1 and 100GBASE-LR1 using the values from 802.3cu D1.1. A supporting presentation will be provided for the TF meeting in Atlanta.

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

REJECT.

Based on the results of Straw Poll #1 taken on the 3/17 interim conference call , the Task Force consensus was to maintain the decision made at the 802.3cu TF meeting in Geneva to remove “TDECQ-10Log10(Ceq) and to clean up the draft to correctly reflect this decision (including among other changes to remove “SECQ-10Log10(Ceq)” from the receiver specifications).

Straw Poll #1:

With regards to the inclusion of TDECQ-10log(Ceq) parameter, I support:
a) Full removal from both Tx and Rx tables: 27
b) Reinstate for both Tx and Rx tables: 9
(17 Abstain)

*Cl* **140** *SC* **140.6.1** *P* **41** *L* **42** # 88

Nicholl, Gary — Cisco Systems

*Comment Type* **TR** *Comment Status* **A** *Tx overshoot*

Transmitter over/under-shoot (max) specifications for 100GBASE-FR1 and 100GBASE-LR1 are too stringent.

*SuggestedRemedy*

Change Transmitter over/under-shoot (max) specifications for 100GBASE-FR1 and 100GBASE-LR1 from 12% to 30%

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

ACCEPT IN PRINCIPLE.

See comment #47

*Cl* **140** *SC* **140.6.1** *P* **41** *L* **42** # 89

Nicholl, Gary Cisco Systems

*Comment Type* **TR** *Comment Status* **R** *Tx overshoot*

Transmitter over/under-shoot (max) specifications for 100GBASE-FR1 and 100GBASE-LR1 currently indicated as normative.

*SuggestedRemedy*

Transmitter over/under-shoot (max) specifications are known to be used by one customer, for a different PAM4 PMD. Change the specifications to informative with an appropriate footnote for both 100BASE-FR1 and 100GBASE-LR1.

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

REJECT.

There is no consensus to implement the suggested remedy.

See comment #47

*Cl* **140** *SC* **140.7.11** *P* **46** *L* **35** # 90

Nicholl, Gary Cisco Systems

*Comment Type* **TR** *Comment Status* **A** *Tx overshoot*

Transmitter over/under-shoot measurement method lacking many definitions

*SuggestedRemedy*

Replace the editors note with the following text:

Transmitter over/under-shoot is measured by applying a noise function to an overshoot level (the convolution of the oscilloscope noise and an ideal gaussian distribution) and scaling the sigma of the noise until the cumulative distribution function (CDF) of the overshoot level meets the CDF of the signal at the SER of the PMD type, and is measured at two windows nominally centered at 0.45 UI and 0.55 UI (with a window width of 0.04 UI). The over/under-shoot test passes if the CDF reaches the prescribed SER below the over/under-shoot level in both of the measurement windows. The combined response of the O/E converter and oscilloscope has a 3 dB bandwidth of approximately 26.5625 GHz with a fourth-order Bessel-Thompson response to at least 1.3 x 53.125 GHz. At frequencies above 1.3 x 53.125 GHz the response should not exceed -20 dB. Compensation may be made for any deviation from an ideal fourth-order Bessel-Thompson response.

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

ACCEPT IN PRINCIPLE.

See comment #47

*Cl* **140** *SC* **140.11.4.6** *P* **54** *L* **28** # 91

Nicholl, Gary Cisco Systems

*Comment Type* **T** *Comment Status* **D** *bucket*

Missing PICS items for Overshoot, TECQ and Receiver Sensitivity tests

*SuggestedRemedy*

Insert Section 140.11.4.4 from 802.3cd before Section 140.11.4.6, and amend to include new PICS itens for Overshoot, TECQ and Receiver Sensitivity. Make this PICS items mandatory for 100GBASE-FR1 and 100GBASE-LR1 only.

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

PROPOSED ACCEPT.

*Cl* **151** *SC* **151.7.1** *P* **63** *L* **15** # 92

Nicholl, Gary Cisco Systems

*Comment Type* **T** *Comment Status* **A** *Tx avg power*

Table 151-7. The relationship between AvgPwr(max) and OMAouter(max) for 400GBASE-LR4-6 is inconsistent with that used for 400GBASE-FR4, 100GBASE-DR, 100GBASE-FR1 and 100BASE-LR1.

In the case of 400GBASE-LF4-6 the average power max is 1.2 dBm higher than the OMA max, but for the other PMDs the average power max is 0.2dB lower than the PMA max.

*SuggestedRemedy*

Make the following changes in Table 151-7:

Change the Average launch power, each lane (max) for 400GBASE-LR4-6 from 5.6 dBm to 4.2 dBm.
Change the Total average launch power (max) for 400GBASE-LR4-6 from 11.6 dBm to 10.2 dBm.

Make the following changes in Table 151-8:

Change the Average receive power, each lane (max) for 400GBASE-LR4-6 from 5.6 dBm to 4.2dBm.
Change the Damage thresholda, each lane for 400GBASE-LR4-6 from 6.6 dBm to 5.2dBm.

Make the following changes to Table 151-16 in Section 151.12:

Change the 400GBASE-LR4-6 transmitter to 400GBASE-FR4 receiver Min loss from 2.1 dB to 0.7dB.

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

ACCEPT.

*Cl* **151** *SC* **151.7.1** *P* **63** *L* **28** # 93

Nicholl, Gary — Cisco Systems

*Comment Type* **TR** *Comment Status* **R** *Tx 10logCeq*

TDECQ-10log10(Ceq)(Max) was removed from Table 151-7.

*SuggestedRemedy*

Reinstate TDECQ-10log10(Ceq)(Max) for 400GBASE-FR4 and 400GBASE-LR4-6 in Table 151-7, and using the values from 802.3cu D1.1

A supporting presentation will be provided for the TF meeting in Atlanta.

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

REJECT.

See comment #87

*Cl* **151** *SC* **151.7.1** *P* **63** *L* **38** # 94

Nicholl, Gary — Cisco Systems

*Comment Type* **TR** *Comment Status* **A** *Tx overshoot*

Transmitter over/under-shoot (max) specifications for 400GBASE-FR4 and 400GBASE-LR4-6 are too stringent

*SuggestedRemedy*

Change Transmitter over/under-shoot (max) specifications for 400GBASE-FR4 and 400GBASE-LR4-6 from 12% to 30%

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

ACCEPT IN PRINCIPLE.

See comment #47

*Cl* **151** *SC* **151.7.1** *P* **63** *L* **38** # 95

Nicholl, Gary — Cisco Systems

*Comment Type* **TR** *Comment Status* **R** *Tx overshoot*

Transmitter over/under-shoot (max) specifications for 400GBASE-FR4 and 400GBASE-LR4-6 currently indicated as normative.

*SuggestedRemedy*

Transmitter over/under-shoot (max) specifications are known to be used by one customer, for a different PAM4 PMD.Change the specifications to informative with an appropriate footnote for both 400BASE-FR4 and 400GBASE-LR4-6.

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

REJECT.

There is no consensus to implement the suggested remedy.

See comment #47

*Cl* **151** *SC* **151.8.10** *P* **70** *L* **32** # 96

Nicholl, Gary — Cisco Systems

*Comment Type* **T** *Comment Status* **A** *Rx sensitivity*

This paragraph says that both RS and SRS are normative. Yet the statements use the word "should" which is associated with an informative specification.

Like everywhere else in 802.3, the difference between normative and informative is clear from the wording, "shall" vs "should" or "may". From the standards style manual: "The word should indicates that among several possibilities, one is recommended as particularly suitable without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required (should equals is recommended that)."

*SuggestedRemedy*

If a normative specfication is intended, then change the statements above to normative ("shall") statements.

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

ACCEPT IN PRINCIPLE.
Change "should" to "shall" in 151.8.10 - line 35 and line 38.

*Cl* **151** *SC* **151.8.12** *P* **73** *L* **44** # 97

Nicholl, Gary — Cisco Systems

*Comment Type* **TR** *Comment Status* **A** *Tx overshoot*

Transmitter over/under-shoot measurement method lacking many definitions

*SuggestedRemedy*

Replace the editors note with the following text:

Transmitter over/under-shoot is measured by applying a noise function to an overshoot level (the convolution of the oscilloscope noise and an ideal gaussian distribution) and scaling the sigma of the noise until the cumulative distribution function (CDF) of the overshoot level meets the CDF of the signal at the SER of the PMD type, and is measured at two windows nominally centered at 0.45 UI and 0.55 UI (with a window width of 0.04 UI). The over/under-shoot test passes if the CDF reaches the prescribed SER below the over/under-shoot level in both of the measurement windows. The combined response of the O/E converter and oscilloscope has a 3 dB bandwidth of approximately 26.5625 GHz with a fourth-order Bessel-Thompson response to at least 1.3 x 53.125 GHz. At frequencies above 1.3 x 53.125 GHz the response should not exceed -20 dB. Compensation may be made for any deviation from an ideal fourth-order Bessel-Thompson response.

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

ACCEPT IN PRINCIPLE.

See comment #47

*Cl* **151** *SC* **151.13.4.5** *P* **82** *L* **24** # 98

Nicholl, Gary — Cisco Systems

*Comment Type* **T** *Comment Status* **D** *bucket*

Missing PICS items for Overshoot, TECQ and Receiver Sensitivity tests

*SuggestedRemedy*

Add new PICS items for Overshoot, TECQ and Receiver Sensitivity tests

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

PROPOSED ACCEPT.

*Cl* **FM** *SC* **FM** *P* **12** *L* **13** # 99

Dudek, Mike — Marvell.

*Comment Type* **E** *Comment Status* **D** *bucket*

802.3cm project is complete

*SuggestedRemedy*

Change 20xx to the appropriate date.

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

PROPOSED ACCEPT.

*Cl* **00** *SC* **0** *P* **44** *L* **18** # 100

Dudek, Mike — Marvell.

*Comment Type* **E** *Comment Status* **D** *bucket*

Incorrect reference in table 140-8

*SuggestedRemedy*

Change the maximum discrete reflectance from "see 140.10.3" to "see 140.10.2.2

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

PROPOSED ACCEPT.

*Cl* **140** *SC* **140.7.5.1** *P* **45** *L* **25** # 101

Dudek, Mike — Marvell.

*Comment Type* **T** *Comment Status* **A** *Tx Ref equalizer*

The reference equalizer for 100GBASE-FR1 and 100GBASE-LR1 needs to be defined.

*SuggestedRemedy*

Bring 140.7.5.1 into the draft and change "100GBASE-DR" to "100GBASE-DR, 100GBASE-FR1 and 100GBASE-LR1"

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

ACCEPT IN PRINCIPLE.
See response to comment #74

*Cl* **140** *SC* **140.7.9** *P* **45** *L* **50** # 102

Dudek, Mike Marvell.

*Comment Type* **T** *Comment Status* **A** *Rx sensitivity*

This section is ambiguous as to whether sensitivity is normative or not for FR1 and LR1. It is pretty clear that it is normative on line 50, but "should" is used not "shall" on lines 37 and 42.

*SuggestedRemedy*

Change "should meet" to "shall meet" on lines 37 and 42.

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

ACCEPT IN PRINCIPLE.

See response to comment #29.

---

*Cl* **140** *SC* **140.10a** *P* **51** *L* **11** # 103

Dudek, Mike Marvell.

*Comment Type* **T** *Comment Status* **A** *Interop*

The 100GBASE-LR1 receiver has 2.2dB better stressed sensitivity than DR at the same SECQ. The max attenuation should be 2.2dB more than the max DR channel attenuation (2.6dB in table 140-12) as the channels are the same except for attenuation.

*SuggestedRemedy*

Change the maximum loss from 4.5dB to 4.8dB.

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

ACCEPT.

---

*Cl* **140** *SC* **140.10a** *P* **51** *L* **10** # 104

Dudek, Mike Marvell.

*Comment Type* **T** *Comment Status* **A** *Interop*

The 100GBASE-LR1 transmitter has a minimum OMA-TDECQ increase of 1.5 dB over DR (when extinction ratio is between 4.5 and 5dB). The max attenuation should be 1.5dB more than the max DR channel attenuation (2.6dB in table 140-12) as the channels are the same except for attenuation.

*SuggestedRemedy*

Change the maximum loss from 3.9dB to 4.1dB.

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

ACCEPT.

---

*Cl* **140** *SC* **140.10b** *P* **51** *L* **32** # 105

Dudek, Mike Marvell.

*Comment Type* **T** *Comment Status* **A** *Interop*

The 100GBASE-LR1 receiver has 1.6dB better stressed sensitivity than FR1 at the same SECQ. The max attenuation should be 1.6dB more than the max FR channel attenuation (4dB) as the channels are the same except for attenuation.

*SuggestedRemedy*

Change the maximum loss from 5.1dB to 5.6dB.

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

ACCEPT.

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*Cl* **140** *SC* **140.10b** *P* **51** *L* **33** # 106

Dudek, Mike Marvell.

*Comment Type* **T** *Comment Status* **A** *Interop*

The 100GBASE-LR1 transmitter has an OMA-TDECQ increase of 1.2 over FR1. The max attenuation should be 1.2dB more than the max FR1 channel attenuation (4dB) as the channels are the same except for attenuation.

*SuggestedRemedy*

Change the maximum loss from 4.9 dB to 5.2dB.

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

ACCEPT.

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*Cl* **140** *SC* **140.11.4.6** *P* **54** *L* **40** # 107

Dudek, Mike Marvell.

*Comment Type* **T** *Comment Status* **D** *bucket*

The requirements for the maximum discrete reflectance in table 140-12 don't apply to LR1/FR1 which are given in Table 140-14

*SuggestedRemedy*

Change the PICs to match the requirements.

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

PROPOSED ACCEPT IN PRINCIPLE.

Change Value/Comment for OC2 to "Meets requirements specified in 140.10.2.2".

*Cl* **151** *SC* **151.5.4** *P* **60** *L* **12** # 108

Dudek, Mike Marvell.

*Comment Type* **T** *Comment Status* **D** *Bucket*

The condition for signal detect fail is Average Optical power <=-30dBm. The Average launch power of OFF transmitter is -16dBm in table 151-7. i.e. an OFF transmitter will not cause signal detect to negate.

*SuggestedRemedy*

Change -30dBm to -16dBm

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

PROPOSED ACCEPT.

*Cl* **151** *SC* **151.7.1** *P* **63** *L* **14** # 109

Dudek, Mike Marvell.

*Comment Type* **T** *Comment Status* **A** *Tx avg power*

The Average launch power each lane (max) seems very low for FR4 compared to LR4-6. (2.1dB lower) whereas the OMA outer max is only 0.7dB higher. (and OMA outer - TDECQ) is only 0.5dB higher. For LR4-6 this max averageoutput with the max OMA the ER would be 3.5dB however which is the min ER. For FR4 at the max OMA the ER would have to be >5.1dB

*SuggestedRemedy*

Consider why there is such a difference in philosophy between allowing a high average power and requiring high overload and damage points versus requiring higher ER when the OMA is high. Adjust the specifications as appropriate.

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

ACCEPT IN PRINCIPLE.
See response to comment #92.

*Cl* **151** *SC* **151.8.2** *P* **66** *L* **42** # 110

Dudek, Mike Marvell.

*Comment Type* **T** *Comment Status* **D** *Bucket*

Table 151-5 does not specify SMSR

*SuggestedRemedy*

Change the table reference to 151-7

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

PROPOSED ACCEPT.

*Cl* **151** *SC* **151.8.10** *P* **70** *L* **35** # 111

Dudek, Mike Marvell.

*Comment Type* **T** *Comment Status* **A** *Rx sensitivity*

This section is somewhat ambiguous as to whether sensitivity is normative or not for FR1 and LR1. It is pretty clear that it is normative on page 71 line 28 but "should" is used not "shall" on lines 35 and 38.

*SuggestedRemedy*

Change "should meet" to "shall meet" on lines 35 and 38.

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

ACCEPT.

*Cl* **151** *SC* **151.8.11** *P* **71** *L* **38** # 112

Dudek, Mike Marvell.

*Comment Type* **E** *Comment Status* **D** *Bucket*

There are only two different patterns allowed

*SuggestedRemedy*

Change "any" to "either"

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

PROPOSED ACCEPT.

*Cl* **151** *SC* **151.8.11.2** *P* **73** *L* **12** # 113

Dudek, Mike Marvell.

*Comment Type* **E** *Comment Status* **D** *Tx RINxx.x*

RINxx.x is not defined in this clause (or the glossary)

*SuggestedRemedy*

Define what it is here.

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

PROPOSED ACCEPT IN PRINCIPLE.

In subclause 151.8.11.2

Change
"With the Gaussian noise generator on and the sinusoidal jitter and sinusoidal interferer turned off, the RINxx.xOMA of the SRS test source shall be no greater than the value specified in Table 151-7 for400GBASE-FR4 and 400GBASE-LR4-6."

to
"With the Gaussian noise generator on and the sinusoidal jitter and sinusoidal interferer turned off, the RINxx.xOMA of the SRS test source (where xx.x is the value for optical return loss tolerance from Table 151-7) shall be no greater than the value specified in Table 151-7 for 400GBASE-FR4 and 400GBASE-LR4-6."

Need to make the same change in clause 140.

Import subclause 140.7.10 from 802.3cd-2018 and make the following change.

Change
"With the Gaussian noise generator on and the sinusoidal jitter and sinusoidal interferer turned off, the RIN15.5OMA of the SRS test source should be no greater than the value specified in Table 140-6."

to
"With the Gaussian noise generator on and the sinusoidal jitter and sinusoidal interferer turned off, the RINxx.xOMA of the SRS test source (where xx.x is the value for optical return loss tolerance from Table 140-6) should be no greater than the value specified in Table 140-6 for 100GBASE-DR, 100GBASE-FR1 and 100GBASE-LR1."

*Cl* **151** *SC* **151.11.2.1** *P* **76** *L* **13** # 114

Dudek, Mike Marvell.

*Comment Type* **T** *Comment Status* **D** *Connector loss*

It seems strange to allow only 2dB connection loss for LR4-6 while FR4 has 3dB when LR4-6 has unallocated margin which is included for extra connectors (not to be extra margin for something we haven't thought of which true unallocated margin is for.) Based on the spec as written cable plant with more than 5dB loss is out of spec, although Table 151-13 does seem to allocate this unallocated margin.

*SuggestedRemedy*

For LR4-6 Change the connection loss from 2dB to 3.3dB. In table 151-9 change Channel Insertion loss to 6.3dB and unallocated margin to 0dB. Delete the 2nd sentence in this paragraph.

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

REJECT.

This comment was WITHDRAWN by the commenter.

*Cl* **151** *SC* **151.12** *P* **73** *L* **52** # 115

Dudek, Mike Marvell.

*Comment Type* **T** *Comment Status* **A** *Interop*

The 400GBASE-LR4-6 receiver has 2.1dB better stressed sensitivity than FR4 at the same SECQ. The max attenuation should be 2.1dB more than the max FR channel attenuation (4dB) as the channels are the same except for attenuation.

*SuggestedRemedy*

Change the maximum loss from 4dB to 6.1dB.

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

ACCEPT.

*Cl* **151** *SC* **151.12** *P* **77** *L* **50** # 116

Dudek, Mike Marvell.

*Comment Type* **T** *Comment Status* **A** *Interop*

The 400GBASE-LR4-6 transmitter has an OMA-TDECQ increase of 0.5dB over FR4. The max attenuation should be 0.5dB more than the max FR1 channel attenuation (4dB) as the channels are the same except for attenuation.

*SuggestedRemedy*

Change the maximum loss from 4 dB to 4.5dB.

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

ACCEPT.

*Cl* **140** *SC* **140.1** *P* **37** *L* **1** # 117

Zimmerman, George — CME Cons./ADI, Cisco, Commscope, Marvell, SenTe

*Comment Type* **E** *Comment Status* **D** *withdrawn*

If it is only the title and header of Table 140-1, say that and don't show all the rows. (usual is "unchanged rows not shown")

*SuggestedRemedy*

Change editing instruction to "Change Title and second column header of Table 140-1 as shown (unchanged rows not shown)"
Delete unchanged rows beginning at first body row.

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

PROPOSED REJECT.

This comment was WITHDRAWN by the commenter.

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*Cl* **151** *SC* **151** *P* **55** *L* **1** # 118

Zimmerman, George — CME Cons./ADI, Cisco, Commscope, Marvell, SenTe

*Comment Type* **E** *Comment Status* **D** *Bucket*

Insert instruction for clause 151 is missing

*SuggestedRemedy*

Add new editing instruction before header to clause 151 - "Insert new clause 151 in numeric order as follows"

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

PROPOSED ACCEPT.

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*Cl* **151** *SC* **151.7.2** *P* **64** *L* **35** # 119

Chang, Frank — Source

*Comment Type* **T** *Comment Status* **A** *Rx 10logCeq*

For FR4 and LR4-6, the usefulness of 10Log(Ceq) is questionable, "SECQ-10Log(Ceq)" is not capable to prevent excess peaking and ensure interop, we will present some test results for this.

*SuggestedRemedy*

Take "SECQ-10Log(Ceq)" out of specs for FR4 and LR4-6 in Table 151-8

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

ACCEPT IN PRINCIPLE.

See comment #56

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*Cl* **151** *SC* **151.8.5** *P* **67** *L* **29** # 120

Chang, Frank — Source

*Comment Type* **E** *Comment Status* **A** *Tx 10logCeq*

"TDECQ -10log(Ceq)" should not be there anymore

*SuggestedRemedy*

Delete "TDECQ -10log(Ceq)"

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

ACCEPT IN PRINCIPLE.

See comment #56

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*Cl* **151** *SC* **151.8.11.2** *P* **73** *L* **17** # 121

Chang, Frank — Source

*Comment Type* **E** *Comment Status* **A** *Rx 10logCeq*

"SECQ - 10log10(Ceq) (max), lane under test" seems not needed any more.

*SuggestedRemedy*

Delete "SECQ - 10log10(Ceq) (max), lane under test"

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

ACCEPT IN PRINCIPLE.

See comment #56

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*Cl* **151** *SC* **151.7.1** *P* **63** *L* **38** # 122

Zivny, Pavel — Tektronix

*Comment Type* **T** *Comment Status* **A** *Tx overshoot*

Table 151.7 , entry "Transmitter over/under-shoot (max)" , value "12%" (both reaches).
In the presentation "zivny_3cu_01_0320" we show that the transmitter overshoot degrades the link performance more significantly in cases of absolute overshoot (rather than relative overhoot). We further show that the peaking impact starts at the level of about 4.5 dBm. (with margin, 4.3 dBm is desirable)

*SuggestedRemedy*

1. remove the 12% overshoot value (same table)
2. in its place insert this overshoot specification:
"Transmitter overshoot (max)" , value "4.3 dBm"
3. follow illustration in the presentation (see aobve) for the definition of "overshoot"

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

ACCEPT IN PRINCIPLE.

See comment #47