

IEEE P802.3cd 50 Gb/s, 100 Gb/s, 200 Gb/s Ethernet 3rd Sponsor recirculation ballot comments

CI **FM** SC **FM** P **8** L **23** # **r03-2**

Anslow, Peter Ciena Corporation

Comment Type **E** Comment Status **D** <bucket>

The names of the participants in the WG ballot stage should be added to the frontmatter.

*SuggestedRemedy*

Add the names of the WG ballot participants to the frontmatter.  
 Remove the names of all of the WG officers and editors from the list.  
 Apply footnote 1 to "Jonathan King":  
 "Not a member of the IEEE 802.3 working group at the beginning of the working group ballot."

Proposed Response Response Status **W**

PROPOSED ACCEPT IN PRINCIPLE.

Add the names of the WG ballot participants to the frontmatter.  
 Remove the names of all of the WG officers and editors from the new list of WG ballot participants.  
 Apply footnote 1 to "Jonathan King":  
 "Not a member of the IEEE 802.3 working group at the beginning of the working group ballot."

CI **000** SC **0** P L # **r03-3**

Anslow, Peter Ciena Corporation

Comment Type **E** Comment Status **D** <bucket>

Now that the P802.3cd draft is nearing the end of sponsor ballot, it is worth ensuring that all tables that split across pages have a "very thin" bottom ruling at the foot of the table on the first page.

*SuggestedRemedy*

Ensure that all tables that split across pages have a "very thin" bottom ruling at the foot of the table on the first page.  
 Applies to at least the table in 135.7.3, the table in 135.7.4.2, the table in 135.7.4.4, Table 136-11, Table 136-18 (2 places), Table 138-9, the table in 139.11.4.1, the table in 135G.5.4.1, and the table in 135G.5.4.2.

Proposed Response Response Status **W**

PROPOSED ACCEPT.

CI **000** SC **0** P **1** L **2** # **r03-1**

Anslow, Peter Ciena Corporation

Comment Type **E** Comment Status **D** <bucket>

Provided that the IEEE SASB approve the IEEE Std 802.3 revision in their meeting on 14 June 2018, the "base\_year" variable should be changed to 2018 throughout the draft.

*SuggestedRemedy*

Provided that the IEEE SASB approve the IEEE Std 802.3 revision in their meeting on 14 June 2018, change the "base\_year" variable to 2018 in all of the files in the draft.

Proposed Response Response Status **W**

PROPOSED ACCEPT IN PRINCIPLE.

The IEEE Std 802.3 revision was approved.

Change the "base\_year" variable to 2018 in all of the files in the draft.

CI **001** SC **1** P **1** L **1** # **r03-6**

Rannow, R K IEEE/SELF

Comment Type **GR** Comment Status **D**

Various uses of undefined, and non-standard acronyms.

*SuggestedRemedy*

Proposed Response Response Status **W**

PROPOSED REJECT.

This comment does not apply to the substantive changes between IEEE P802.3cd D3.2 and D3.3 or the unsatisfied negative comments from the previous ballots. Hence it is not within the scope of the recirculation ballot. (out of scope)

The commenter has not indicated which of the acronyms are undefined or non-standard. Nor has the commenter provided a suggested remedy.

IEEE P802.3cd 50 Gb/s, 100 Gb/s, 200 Gb/s Ethernet 3rd Sponsor recirculation ballot comments

Cl 001 SC 1.4.387 P 40 L 39 # r03-5  
 Marris, Arthur Cadence Design Syst  
 Comment Type E Comment Status D  
 Consider adding Clauses 107, 119, 133 to the PCS clauses listed in: 1.4.387 Physical Coding Sublayer (PCS)  
 SuggestedRemedy  
 Update 1.4.387 to include the PCS Clauses for the 25G, 50G, and 200G and 400G speeds.  
 Also do the same for the PMA clauses in 1.4.392, the PMD clauses in 1.4.393 and the PHY clauses in 1.4.391.  
 Proposed Response Response Status Z  
 PROPOSED REJECT.  
 This comment was WITHDRAWN by the commenter.

Cl 069 SC 69.2.3 P 87 L 10 # r03-4  
 Marris, Arthur Cadence Design Syst  
 Comment Type T Comment Status D <bucket>  
 In Table 69-3a correct 100GAUI references  
 SuggestedRemedy  
 100GAUI-4 C2C is defined in 135D  
 100GAUI-2 C2C is defined in 135F  
 Proposed Response Response Status W  
 PROPOSED ACCEPT.

Cl 135 SC 135.5.5 P 178 L 30 # r03-23  
 Dawe, Piers J G Mellanox Technologie  
 Comment Type E Comment Status D <bucket>  
 Per D3.2 comment 33 and Style Manual  
 SuggestedRemedy  
 Change Note to NOTE  
 Proposed Response Response Status W  
 PROPOSED ACCEPT.

Cl 136 SC 136.9.3.4 P 226 L 16 # r03-18  
 Dudek, Michael Cavium  
 Comment Type TR Comment Status D  
 The existing Transmitter Specifications allow transmitters to pass specification and provide significantly worse performance than the Transmitter used to test cables. This creates an inter-operability problem. A presentation will be made.  
 SuggestedRemedy  
 Add +3 to Equation 136-6  
 Proposed Response Response Status W  
 PROPOSED ACCEPT IN PRINCIPLE.  
 Pending presentation and task force discussion.  
 Note that a presentation on this topic was presented at an ad hoc meeting.  
[http://www.ieee802.org/3/cd/public/adhoc/archive/dudek\\_062718\\_3cd\\_adhoc.pdf](http://www.ieee802.org/3/cd/public/adhoc/archive/dudek_062718_3cd_adhoc.pdf)  
 Implement the suggested remedy.

Cl 137 SC 137.9.2.1 P 249 L 52 # r03-19  
 Dudek, Michael Cavium  
 Comment Type TR Comment Status D <withdrawn>  
 The reference Tx used in COM has an ERL of over 21.5dB whereas the required specification for the Tx is only 15dB. This allows Tx's with significantly poorer performance to pass specification and creates an inter-operability problem. A presentation will be provided  
 SuggestedRemedy  
 Change the Tx ERL specification to 18dB.  
 Proposed Response Response Status Z  
 PROPOSED REJECT.  
 This comment was WITHDRAWN by the commenter.

IEEE P802.3cd 50 Gb/s, 100 Gb/s, 200 Gb/s Ethernet 3rd Sponsor recirculation ballot comments

Cl 138 SC 138.7.1 P 270 L 22 # r03-27  
 Dawe, Piers J G Mellanox Technologie

Comment Type TR Comment Status D

A TDECQ limit of 4.5 dB still has not been justified, given that the same fibres and transmitter, and receiver front-ends that should not be worse, can do 100GBASE-SR4 (PAM2, almost the same signalling rate) without the FFE. king\_3cd\_02\_0118 showed 1 to 2.5 dB with representative drive, and king\_3cd\_03\_0518 shows better than 3.7 dB. chang\_011018\_3cd\_01\_adhoc-v2 showed 2.1 to 3.1 dB, the lower end with threshold adjust, although much of this was with PRBS15.

The high limit in the draft would require a better equalizer (e.g. more precise tap settings) than needed for the SMF PMDs. D.30 comment 119, D3.1 comment 70, D3.2 comment 40

SuggestedRemedy

Consider what actual PAM4 MMF transmitters do (more evidence like king\_3cd\_03\_0518), and compare a minimally compliant 100GBASE-SR4 transmitter, and set the TDECQ limit accordingly, e.g. 4.0 dB.

Proposed Response Response Status W

PROPOSED REJECT.

PAM4 transmitters for MMF with measured TDECQ values up to 4.0 dB have been shown, in king\_3cd\_03\_0518 and in daw\_3cd\_01b\_0518 (slide 9), which supports the P802.3cd draft 3.3 TDECQ limit of 4.5 dB taking account of product variability with larger sample sizes.

The same reference receiver is used for clause 138, 139, and 140. The higher TDECQ for 138 reflects the higher transmitter and link penalties for MMF, not a different reference equalizer.

The current TDECQ limit was arrived at as a compromise between transmitter and receiver capabilities.

Cl 138 SC 138.7.1 P 270 L 22 # r03-28  
 Dawe, Piers J G Mellanox Technologie

Comment Type E Comment Status D

D3.2 comment 41, accepted

SuggestedRemedy

Make the left column wider and the others narrower

Proposed Response Response Status W

PROPOSED REJECT.

The approved response to r02-41 did not include the editorial change requested in this comment.

For reference, the response to comment r02-41 was:

ACCEPT IN PRINCIPLE

Use TDECQ parameter nomenclature consistent with 121, 122, 124, 139 and 140

Note that the draft is professionally edited prior to publication.

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Cl 138 SC 138.7.2 P 271 L 9 # r03-25  
 Dawe, Piers J G Mellanox Technologie

Comment Type TR Comment Status D

In D1.0, OMA-TDECQ was -5 dBm TBC, and the unstressed sensitivity was -7 dBm. Now, OMA-TDECQ is -5.9 and the implied unstressed sensitivity is about -7.3, equivalent to 50GBASE-LR and 1.5 dB harder for the receiver than 50GBASE-FR. The definition of TDECQ has changed a few times, which I think explains why the budget has gone up from 6 dB TBC to 6.5 dB. Min OMA at max TDECQ was -1 dBm TBC in D1.0, -1 in D3.2, is now -1.4. It looks like OMA-TDECQ should have been increased to -5.5 as the apparent TDECQ was reduced. king\_3cd\_01\_0518 had proposed -5.7 dBm.

SuggestedRemedy

I think these changes restore the intent of D1.0, which was based on a TDECQ from about 0 to 4, to go with the present TDECQ which goes from about 0.5 to 4.5: Increase OMA-TDECQ from -5.9 to -5.5 dBm. Increase SRS OMA from -3.4 back to -3 dBm (as in D1.0 and D3.2). Increase the other receiver sensitivity, equation 138-1, from max(-6.5, SECQ - 7.9) to max(-6.1, SECQ - 7.5).

Proposed Response Response Status W

PROPOSED REJECT.

The values in draft 3.3 reflect the discussion and decisions of the task force of TDECQ OMA-TDECQ and receiver sensitivity values which took place during comment resolution during the 802.3cd meeting in May 2018.

For reference see comment r02-9.

The comment does not provide sufficient evidence that the suggested remedy would improve the draft.

Cl 138 SC 138.7.3 P 271 L 42 # r03-26  
 Dawe, Piers J G Mellanox Technologie

Comment Type TR Comment Status D

The effect of modal noise and mode partition noise with a very high TDECQ transmitter (D.30 comment 119, D3.1 comment 70, D3.2 comment 40) and particularly with a very high penalty after equalization ("up the page": see TDECQ presentations) (D3.0 comment 116, D3.1 comment 71, D3.2 comment 46) is higher than with a more moderate penalty after equalization or without equalization as in 100GBASE-SR4. 100GBASE-SR4 takes this "Pcross" effect into account inside TDEC.

SuggestedRemedy

Reduce the headline TDECQ and limit TDECQ-10log10(Ceq) to make room for this in the budget, and/or Adjust the definition of TDECQ for MMF to take this into account. Adjust the budgets as needed.

Proposed Response Response Status W

PROPOSED REJECT.

0.1 dB is included in the 'Allocation for penalties' to cover mode partition noise and modal noise penalties, and has been included in the link budget since adoption of the baseline.

No evidence has been presented showing an issue with the draft.

Cl 138 SC 138.8.1 P 272 L 37 # r03-12  
 Le Cheminant, Greg

Comment Type T Comment Status D <withdrawn>  
 See above

SuggestedRemedy

Change "Square wave" to "Square wave or 6"

Proposed Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

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Cl 138 SC 138.8.5 P 273 L 34 # r03-9  
 Stassar, Peter Huawei Technologies

Comment Type TR Comment Status D

Since the acceptance of modified filter characteristics for SECQ, as a result of resolution to comment #r02-62 at the May 2018 meeting, the filter characteristics for TDECQ, transition time and SECQ are now inconsistent. The difference between TDECQ and SECQ is only the presence of a test fiber in TDECQ, so the filter characteristics should be the same. The filter characteristics for TDECQ, Transition time and SECQ, will need to be aligned. Similarly for Clauses 139.7 and 140.7

*SuggestedRemedy*

- There are 3 options to resolve this comment: 1. Reverting decision of Pittsburgh on the SECQ filter.  
 2. Adopting the revised SECQ filter characteristics also for TDECQ and Transition Time.  
 3. If the current SECQ filter is not adequate for TDECQ then create a formulation that is adequate for TDECQ and apply it also to transition time and SECQ.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

For discussion in TF meeting and review of presentation.

Cl 138 SC 138.8.5 P 273 L 40 # r03-30  
 Dawe, Piers J G Mellanox Technologie

Comment Type TR Comment Status D

In this draft, it is still possible to make a bad MMF transmitter with emphasis (e.g. with a distorted signal) that even an equalizer better than the reference equalizer won't be able to improve. Note the receiver is tested for a slow signal only, not for such signals. This issue is worse for MMF because of the high TDECQ limit and because the low bandwidth reference filter allows more Tx emphasis than for SMF. But notice that in the survey (e.g. dawe\_3cd\_01b\_0518 slide 8), the MMF points are to the right of 0.5 dB and below 2.5 dB, not near the upper left. We need to exclude unnecessary regions, too high up the TDECQ map, that would waste equalizer power and complexity, and would allow non-resilient links if such signals were ever fielded.  
 D3.0 comment 116, D3.1 comment 71, D3.2 comment 46.

*SuggestedRemedy*

Limit TDECQ  $-10 \cdot \log_{10}(C_{eq})$  to 0.5 dB less than the max. TDECQ.  
 E.g. for a MMF TDECQ limit of 4 dB, limit TDECQ  $-10 \cdot \log_{10}(C_{eq})$  to 3.5 dB.  
 Add the limit to the transmitter and receiver (conditions of stressed receiver sensitivity test) tables if appropriate.  
 This limit protects the equalizer and decision circuit or A to D from very bad waveforms, while OMA-TDECQ protects the receiver front end from excessive sensitivity demands.

Proposed Response Response Status W

PROPOSED REJECT.

See resolution to comment r03-36.

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Cl 138 SC 138.8.5.1 P 273 L 45 # r03-32  
 Dawe, Piers J G Mellanox Technologie

Comment Type TR Comment Status D

For some equalizer architectures, precursors are much more expensive than post-cursors (sun\_3cd\_042518\_adhoc).  
 D3.1 comment 73, D3.2 comments 7, 8, 48, 53.

*SuggestedRemedy*

When we have decided what range of MMF signals are useful and allowed, review the value of the second precursor considering chromatic and modal dispersion. If it's small, continue the improvement made in king\_3cd\_03\_0118: change "Tap 1, tap 2, or tap 3, has" to "Tap 1 or tap 2 has".  
 There is a separate comment for SMF because the different TDECQ limit and dispersion there could lead to a different conclusion.

Proposed Response Response Status W

PROPOSED REJECT.

Repeat of previous comments r02-48 and r02-53. During comment resolution on D3.2 a similar proposal was rejected for 50G PAM4 based PMDs.

The response to r02-48 is shown here for reference:  
 Allowing just one pre-cursor in the reference EQ means the transmitted signal, when propagated through a worst case channel, cannot have a significant amount of pre-cursor response at the receiver without suffering higher TDECQ penalty.  
 An electrical channel typically can guarantee that, however the chromatic and modal dispersion effects of the optical channel in combination with laser performance may require the extra tap.

Subject to review of new presentation and discussion by the task force.

Cl 138 SC 138.8.5.1 P 274 L 1 # r03-31  
 Dawe, Piers J G Mellanox Technologie

Comment Type TR Comment Status D

TDECQ for MMF is measured through a specially low bandwidth, so for the same extreme transmitter emphasis, the reference equalizer's largest magnitude tap coefficient is larger (0.87 vs. 0.8 in daw\_3cd\_01b\_0518) than for SMF. Further, the survey results for MMF (green points, slide 3, daw\_3cd\_01b\_0518) are all to the right of +0.5 dB. So the spec can be made more realistic, which makes building the SRS tester easier as well as removing unnecessary design space from the receiver.

*SuggestedRemedy*

(Just for Clause 138) in "the largest magnitude tap coefficient, which is constrained to be at least 0.8", change 0.8 to 1.

Proposed Response Response Status W

PROPOSED REJECT.

TDECQ for MMF is measured through a receiver bandwidth which is lower than that for SMF because it includes the channel response. TDECQ for SMF PMDs is measured through a worst case chromatic dispersion fibre which accounts for much, if not all, of the difference.

While VCSEL measurements to date have shown slightly higher TDECQ penalties than SMF transmitters due to low bandwidth, this does not reflect low temperature performance or future transmitter and VCSEL driver developments which would have better margins to the TDECQ limit and better yield/lower cost. Increasing the minimum coefficient of the largest magnitude tap will reduce the flexibility for the transmitter design.

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Cl 138 SC 138.8.7 P 274 L 25 # r03-44

Le Cheminant, Greg

Comment Type T Comment Status D

The transmitter transition time measurement that has been added to optical transmitter specifications uses a square wave pattern of eight sequential 3's followed by eight sequential 0's. The long runs of symbols ensure stable amplitudes from which to derive the 20% and 80% signal level thresholds used to construct a transition time measurement. The TDECQ, OuterOMA, and extinction ratio measurements can be made from a single acquisition of the SSPRQ pattern. To simplify the transmitter test process, a transmitter transition time measurement should also be considered valid if performed on the SSPRQ pattern. In the SSPRQ pattern there are two 0000033333 and two 3333300000 sequences. A transition time measurement made on either of these sequences should be equivalent to the measurement made on the square wave pattern.

*SuggestedRemedy*

Change 138.8.7 line 25 from "".....using the test pattern....."" to "".....using a test pattern....."" And line 36 from "".....square wave test pattern is used."" to "".....square wave test pattern is used. When the SSPRQ pattern is used, P0 is measured over the central 2UI of the run of 5 zeroes and P3 is measured over the central 2UI of the run of 5 threes in the 0000033333 or 3333300000 sequences". Also change table 138-12 page 272 line 37 from "Square wave" to "Square wave or 6"

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Implement the proposed remedy, with editorial license.

Further modifications pending presentation and task force discussion.

Cl 138 SC 138.8.7 P 274 L 25 # r03-11

Le Cheminant, Greg

Comment Type T Comment Status D <withdrawn>

The transmitter transition time measurement that has been added to optical transmitter specifications uses a square wave pattern of eight sequential 3's followed by eight sequential 0's. The long runs of symbols ensure stable amplitudes from which to derive the 20% and 80% signal level thresholds used to construct a transition time measurement. The TDECQ, OuterOMA, and extinction ratio measurements can be made from a single acquisition of the SSPRQ pattern. To simplify the transmitter test process, a transmitter transition time measurement should also be considered valid if performed on the SSPRQ pattern. In the SSPRQ pattern there are two 0000033333 and two 3333300000 sequences. A transition time measurement made on either of these sequences should be equivalent to the measurement made on the square wave pattern.

*SuggestedRemedy*

Change 138.8.7 line 25 from "".....using the test pattern....."" to "".....using a test pattern....."" And line 36 from "".....square wave test pattern is used."" to "".....square wave test pattern is used. When the SSPRQ pattern is used, P0 is measured over the central 2UI of the run of 5 zeroes and P3 is measured over the central 2UI of the run of 5 threes in the 0000033333 or 3333300000 sequences"

Proposed Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

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CI 138 SC 138.8.7 P 274 L 28 # r03-33  
 Dawe, Piers J G Mellanox Technologie

Comment Type T Comment Status D

1. For consistency and so that transition time is a free by-product of a TDECQ measurement as intended by D3.2 comment 54, we should be able to measure transition time on the same pattern as other things, SSPRQ, and with the same observation bandwidth.
2. As it is intended to exclude signals that would cause receive equalizer issues (e.g. require better linearity and/or finer AtoD or tap resolution or stronger tap weights), what matters is a fitted signal, not the actual signal. So the limit can be based on the average of the rising and falling edges rather than the slower of them.
3. Then, with a more consistent measurement, the limit might be tightened a little.

SuggestedRemedy

1. Add PRBS13Q and SSPRQ options for transition time measurement and associated P0 and P3: define the places in the patterns to measure, change the entry in Table 139-10, Test-pattern definitions and related subclauses, from "Square wave" to "4, 6 or square wave". If that doesn't work, consider changing to a maximum cursor strength limit, which really is a free by-product of a TDECQ measurement. Check what difference it would make to measure in the 11.2 GHz bandwidth. If we do that for transmitters (free by-product) the limit for SRS would be that in 13.28125 GHz (going with SECQ).
2. Change "the slower of the time interval of the transition from 20% ..., or from 80% ..." to "the average of the time intervals of the transition from 20% ..., and from 80% ...".
3. Reduce 34 ps to 30-32 ps if appropriate.

Proposed Response Response Status W  
 PROPOSED ACCEPT IN PRINCIPLE.

See response to r03-44.

Transition time specifications for Tx have just been introduced in D3.3. Insufficient evidence/analysis has been provided to show that it is better to average rise and fall time. The remedy is speculative and optional, provided in the form of an action plan.

CI 138 SC 138.8.10 P 275 L 37 # r03-34  
 Dawe, Piers J G Mellanox Technologie

Comment Type T Comment Status D

This says "The SECQ of the stressed receiver conformance test signal is measured according to 138.8.5, except that the combination of the O/E and the oscilloscope..." but 138.8.5 doesn't mention SECQ.

SuggestedRemedy

Change to "The SECQ of the stressed receiver conformance test signal is measured similarly to TDECQ according to 138.8.5, except that the combination of the O/E and the oscilloscope..."

Proposed Response Response Status W  
 PROPOSED REJECT.

The draft states correctly that SECQ is measured according to 138.8.5, but with appropriate exceptions.

CI 138 SC 138.8.10 P 275 L 40 # r03-29  
 Dawe, Piers J G Mellanox Technologie

Comment Type T Comment Status D

D3.2 comment 62 proposed "to no less than 0.9 \* 26.5625 GHz; afterwards the level doesn't grow past the level achieved at the abovementioned frequency" while this says "and at frequencies between 0.9 x 26.5625 GHz and 1.5 x 26.5625 GHz the response should not exceed the Bessel-Thomson response". As the Bessel-Thomson response continues to roll off between 0.9 x 26.5625 GHz and 1.5 x 26.5625 GHz, it's a significantly stricter requirement and may conflict with achieving an accurate response below 0.9 x 26.5625 GHz.

SuggestedRemedy

I just want to check if we really need such a particular and unusual requirement.

Proposed Response Response Status W  
 PROPOSED ACCEPT IN PRINCIPLE.

For discussion in TF meeting and review of presentation.  
 See response to r03-09.

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Cl 138 SC 138.8.10 P 275 L 43 # r03-39

Dawe, Piers J G

Mellanox Technologie

Comment Type TR Comment Status D

The rule of "at least half of the dB value of the stressed eye closure" is not consistent with the transmitter specs (D3.2 comment 55) for any of the optical PMDs.

*SuggestedRemedy*

When we have decided where the corner between the "top limit" and the "diagonal limit" on the TDECQ map is (see other comments), align the SRS range to that:

Add another exception, saying that the requirement that the combination of the low-pass filter and the E/O converter should have a frequency response that results in at least half of the dB value of the stressed eye closure (SECQ) before the sinusoidal and Gaussian noise terms are added, does not apply.

Change "The signaling rate and the required stressed eye closure (SECQ) of the stressed receiver conformance test signal is specified in Table 138-9" to "The signaling rate, the required stressed eye closure (SECQ) and  $SECQ \cdot 10 \cdot \log_{10}(C_{eq})$  of the stressed receiver conformance test signal are specified in Table 138-9. For a particular setup, one of SECQ and  $SECQ \cdot 10 \cdot \log_{10}(C_{eq})$  matches the table and the other is lower. A pattern generator with emphasis may be used."

Do we want to give more advice about this, e.g. a 2-tap FIR, which one is the cursor? The FIR is to move the test condition to the left; to move it to the right the filter should be used. Also in 138 and 140.

Proposed Response Response Status W

PROPOSED REJECT.

Repeat of comment r02-55 to D3.2, which was rejected with statement: no changes to the draft proposed.

The requirement that at least half of the dB value of the stressed eye closure is due to low-pass filtering means that the SRS test source exerceizes both the equalizer and the CDR/sampling-phase functions of the receiver.

The proposed remedy reads like a process description with a timeline and questions to be answered without specific implementable changes to the current draft.

Cl 138 SC 138.8.10 P 275 L 45 # r03-24

Dawe, Piers J G

Mellanox Technologie

Comment Type TR Comment Status D

In practice, the receiver may experience noise from modal noise and mode partition noise as well as from RIN. Although there is a small allocation for these in the budget, it would be as well to allow the SRS to use the anticipated amount of noise from all causes, not just from RIN.

*SuggestedRemedy*

Change "should be no greater than the RIN12OMA (max) specified for the transmit characteristics in Table 138-8" (which means -128 dB/Hz) to "-127 dB/Hz" or "-126 dB/Hz" as appropriate.

Proposed Response Response Status W

PROPOSED REJECT.

No evidence provided that there is a problem with the draft and that the proposed remedy fixes the claimed problem.

Cl 138 SC 138.8.10 P 275 L 50 # r03-35

Dawe, Piers J G

Mellanox Technologie

Comment Type T Comment Status D

The SRS recipe doesn't mention the largest magnitude tap coefficient limit. It should, else someone could create a very under-stressed signal (although not realistic) by applying too much emphasis.

*SuggestedRemedy*

Add: the largest magnitude tap coefficient in the SECQ calibration should be at least the limit given in 138.8.5.1 without the constraint mentioned there.

Proposed Response Response Status W

PROPOSED REJECT.

The current draft already includes this by referring to 138.8.5 with just one exception.

All other conditions in 138.8.5 apply.

"The SECQ of the stressed receiver conformance test signal is measured according to 138.8.5, except that the combination of the O/E and the oscilloscope..."

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CI 139 SC 139.6 P 293 L 43 # r03-21  
 Tamura, Kohichi Oclaro

Comment Type TR Comment Status D

In D3.2, 1% OMA threshold adjustment was introduced to the TDECQ algorithm in order to improve the yields of transmitters with slightly unequal eye levels and to improve correlation between changes in TDECQ and receiver sensitivity. Real receivers have threshold adjustment capability exceeding 1%, so the changes will mainly benefit transmitters with some nonlinearity, such as DML, but not adversely impact receivers. However, in D3.3, TDECQ (max) of 50GBASE-FR and 50GBASE-LR were reduced from 3.2 dB to 2.8 dB and from 3.4 dB to 3 dB, respectively, which negated the improvement gained with threshold adjustment. Furthermore, highly linear transmitters, for which TDECQ is the same with or without threshold adjustment, were penalized by a reduction in TDECQ (max) by 0.4 dB.

*SuggestedRemedy*

In Table 139-6, change TDECQ (max) of 50GBASE-FR from 2.8 dB to 3.2 dB.  
 In Table 139-6, change TDECQ (max) of 50GBASE-LR from 3 dB to 3.4 dB.

These changes will require additional changes as described below in other parts of the draft.

In Table 139-7, change "Stressed receiver sensitivity ... (max)" of 50GBASE-FR from -5.5 dB to -5.1 dB.

In Table 139-7, change "Stressed receiver sensitivity ... (max)" of 50GBASE-LR from -6.8 dB to -6.4 dB.

In Table 139-7, change foot note "c" from "... SECQ up to 2.8 dB for 50GBASE-FR and 3 dB for 50GBASE-LR." to "... SECQ up to 3.2 dB for 50GBASE-FR and 3.4 dB for 50GBASE-LR."

In Table 139-8, change "Power budget" of 50GBASE-FR from 7.2 dB to 7.6 dB.

In Table 139-8, change "Power budget" of 50GBASE-LR from 9.9 dB to 10.3 dB.

In Table 139-8, change "Allocation for penalties" of 50GBASE-FR from 3.2 dB to 3.6 dB.

In Table 139-8, change "Allocation for penalties" of 50GBASE-LR from 3.6 dB to 4 dB.

In 139.7.9, change "... SECQ up to 2.8 dB" to "... SECQ up to 3.2 dB" for 50GBASE-FR

In 139.7.9, change "... SECQ up to 3 dB" to "... SECQ up to 3.4 dB" for 50GBASE-LR.

In 139.7.9, change Figure 139-6 so that curves include SECQ of 3.2 dB and 3.4 dB for 50GBASE-FR and 50GBASE-LR, respectively.

Proposed Response Response Status W

PROPOSED REJECT.

Subject to presentation and task force discussion.

The proposed remedy reverses the changes agreed by the task force in the 802.3cd May meeting, which was supported with modeling and experiment.

CI 139 SC 139.6 P 293 L 43 # r03-43  
 Liu, Hai-Feng Intel Corporation

Comment Type TR Comment Status D

The primary benefit of introducing threshold adjustment in D3.2 was to improve the TDECQ and link BER penalty correlation. This change would also relax the TDECQ for those Tx with unequal sub-eyes. In D3.3, TDECQmax was reduced to keep the maximum sub-eye inequality no greater than before threshold adjustment was added. However, the proposed 0.4 dB reduction from 3.4 dB to 3 dB was based on the simulation/measurement for the worst symmetric eye compression case under 1% threshold adjustment. Applying the same 0.4 dB reduction in TDECQ max across the board will unnecessarily penalize a large portion of good Tx that would have nearly equal sub-eyes. These Tx will gain little in terms of TDECQ from the threshold adjustment, but the 0.4 dB reduction in TDECQmax will result in significant loss. In addition, the worst symmetric eye compression case is far from practical as it can be avoided at least for MZI and EML based Tx.

*SuggestedRemedy*

In Table 139-6, change TDECQ (max) of 50GBASE-FR from 2.8 dB to 3.2 dB.

In Table 139-6, change TDECQ (max) of 50GBASE-LR from 3 dB to 3.4 dB.

In Table 139-7, change "Stressed receiver sensitivity ... (max)" of 50GBASE-FR from -5.5 dB to -5.1 dB.

In Table 139-7, change "Stressed receiver sensitivity ... (max)" of 50GBASE-LR from -6.8 dB to -6.4 dB.

In Table 139-7, change "Stress eye closure for PAM4 (SECQ) of 50GBASE-FR from 2.8 dB to 3.2 dB

In Table 139-7, change "Stress eye closure for PAM4 (SECQ) of 50GBASE-LR from 3 dB to 3.4 dB

In Table 139-7, change foot note "c" from "... SECQ up to 2.8 dB for 50GBASE-FR and 3 dB for 50GBASE-LR." to "... SECQ up to 3.2 dB for 50GBASE-FR and 3.4 dB for 50GBASE-LR."

In Table 139-8, change "Power budget" of 50GBASE-FR from 7.2 dB to 7.6 dB.

In Table 139-8, change "Power budget" of 50GBASE-LR from 9.9 dB to 10.3 dB.

In Table 139-8, change "Allocation for penalties" of 50GBASE-FR from 3.2 dB to 3.6 dB.

In Table 139-8, change "Allocation for penalties" of 50GBASE-LR from 3.6 dB to 4 dB.

In 139.7.9, change "... SECQ up to 2.8 dB" to "... SECQ up to 3.2 dB" for 50GBASE-FR

In 139.7.9, change "... SECQ up to 3 dB" to "... SECQ up to 3.4 dB" for 50GBASE-LR.

Proposed Response Response Status W

PROPOSED REJECT.

See response to r03-21.

IEEE P802.3cd 50 Gb/s, 100 Gb/s, 200 Gb/s Ethernet 3rd Sponsor recirculation ballot comments

Cl 139 SC 139.7.1 P 296 L 16 # r03-14  
 Le Cheminant, Greg  
 Comment Type T Comment Status D <withdrawn>  
 See above  
 SuggestedRemedy  
 Change "Square wave" to "Square wave or 6"  
 Proposed Response Response Status Z  
 REJECT.  
 This comment was WITHDRAWN by the commenter.

Cl 139 SC 139.7.5.3 P 298 L 52 # r03-36  
 Dawe, Piers J G Mellanox Technologie  
 Comment Type TR Comment Status D  
 In this draft, it is still possible to make a bad SMF transmitter with emphasis (e.g. with a distorted signal) that even an equalizer better than the reference equalizer won't be able to improve. Note the receiver is tested for a slow signal only, not for such signals. But notice that in the survey (e.g. daw\_3cd\_01b\_0518 slide 8), the 50G SMF points are near neutral and below 1.8 dB, not near the upper left.  
 We need to exclude unnecessary regions, too high up the TDECQ map, that would waste equalizer power and complexity.  
 D3.0 comment 116, D3.1 comment 71, D3.2 comment 52.  
 SuggestedRemedy  
 Limit TDECQ  $-10 \cdot \log_{10}(\text{Ceq})$  to the lower of 3 dB or the max. TDECQ.  
 E.g. for a SMF TDECQ limit of 2.8 dB (50GBASE-FR), limit TDECQ  $-10 \cdot \log_{10}(\text{Ceq})$  to 2.8 dB; for 3 dB (50GBASE-LR), limit TDECQ  $-10 \cdot \log_{10}(\text{Ceq})$  to 3 dB.  
 Add the limit to the transmitter and receiver (conditions of stressed receiver sensitivity test) tables if appropriate.  
 This limit protects the equalizer and decision circuit or A to D from worse than reasonable waveforms, while OMA-TDECQ protects the receiver front end from excessive sensitivity demands.  
 Proposed Response Response Status W  
 PROPOSED REJECT.  
 Subject to discussion and review by the task force on presentations on this topic.  
 There have been presentations on this subject at the ad hoc meetings:  
[http://www.ieee802.org/3/cd/public/adhoc/archive/dawe\\_062718\\_01a\\_3cd\\_adhoc.pdf](http://www.ieee802.org/3/cd/public/adhoc/archive/dawe_062718_01a_3cd_adhoc.pdf)  
[http://www.ieee802.org/3/cd/public/adhoc/archive/anslow\\_062718\\_3cd\\_adhoc.pdf](http://www.ieee802.org/3/cd/public/adhoc/archive/anslow_062718_3cd_adhoc.pdf)  
[http://www.ieee802.org/3/cd/public/adhoc/archive/tamura\\_062718\\_3cd\\_adhoc-v2.pdf](http://www.ieee802.org/3/cd/public/adhoc/archive/tamura_062718_3cd_adhoc-v2.pdf)

Cl 139 SC 139.7.5.4 P 299 L 5 # r03-37  
 Dawe, Piers J G Mellanox Technologie  
 Comment Type TR Comment Status D  
 For some equalizer architectures, precursors are much more expensive than post-cursors (sun\_3cd\_042518\_adhoc). Further investigation of possible minimally compliant SMF signals and their associated TDECQ FFE settings indicates that 2 pre, 2 post (making the cursor the third tap) is never significantly better than 1 pre, 3 post (making it the second tap), for compliant signals (but not yet including chromatic dispersion). See daw\_3cd\_01a\_0318. Further refining the TDECQ search rules will avoid inefficiency both in product receiver design, testing and operation, and in TDECQ testing. D3.1 comment 76, D3.2 comment 53.  
 SuggestedRemedy  
 Review the value of the second precursor considering chromatic dispersion. If it's small, continue the improvement made in king\_3cd\_03\_0118: change "Tap 1, tap 2, or tap 3, has" to "Tap 1 or tap 2 has", like 100GBASE-DR. Increase the max TDECQ a little if appropriate.  
 There is a separate comment for MMF because the different TDECQ limit there could lead to a different conclusion.  
 Proposed Response Response Status W  
 PROPOSED REJECT.  
 No evidence has been shown that there is a problem with the current draft. The remedy is not specific.  
 No specific changes to the draft proposed

IEEE P802.3cd 50 Gb/s, 100 Gb/s, 200 Gb/s Ethernet 3rd Sponsor recirculation ballot comments

Cl 139 SC 139.7.5.4 P 299 L 22 # r03-47  
Sun, Phil

Comment Type T Comment Status D

Current spec allows TDECQ reference receiver to have up to two precursors for 50GBASE-FR and 50GBASE-LR. As explained in sun\_3cd\_042518\_adhoc, this forces receivers to implement multiple precursors and choose power-hungry solutions. As a result, module power will be kept high forever to ensure interoperability with bad transmitters. On the other hand, precursor 2 impact on TDECQ is minimal for 50GBASE-FR and small for 50GBASE-LR. Meanwhile it can be compensated by TX. Allowing no more than 1 precursor also helps to reduce test time.

SuggestedRemedy

"Add:  
For 50GBASE-FR, Tap 1 or tap 2 has the largest magnitude tap coefficient."

Proposed Response Response Status W

PROPOSED REJECT.

This comment was received after the ballot closed. (late)

This is a similar comment to r02-53 for which the response is shown here for reference: REJECT: Allowing just one pre-cursor in the reference EQ means the transmitted signal, when propagated through a worst case channel, cannot have a significant amount of precursor response at the receiver without suffering higher TDECQ penalty.

An electrical channel typically can guarantee that, however the chromatic and modal dispersion effects of the optical channel in combination with laser performance may require the extra tap. No evidence has been provided to show otherwise.

Pending presentation and task force discussion.

Cl 139 SC 139.7.7 P 299 L 34 # r03-45  
Le Cheminant, Greg

Comment Type T Comment Status D

The transmitter transition time measurement that has been added to optical transmitter specifications uses a square wave pattern of eight sequential 3's followed by eight sequential 0's. The long runs of symbols ensure stable amplitudes from which to derive the 20% and 80% signal level thresholds used to construct a transition time measurement. The TDECQ, OuterOMA, and extinction ratio measurements can be made from a single acquisition of the SSPRQ pattern. To simplify the transmitter test process, a transmitter transition time measurement should also be considered valid if performed on the SSPRQ pattern. In the SSPRQ pattern there are two 0000033333 and two 3333300000 sequences. A transition time measurement made on either of these sequences should be equivalent to the measurement made on the square wave pattern.

SuggestedRemedy

Change 139.7.7 line 34 from "".....using the test pattern....."" to "".....using a test pattern....."" And line 45 from "".....square wave test pattern is used."" to "".....square wave test pattern is used. When the SSPRQ pattern is used, P0 is measured over the central 2UI of the run of 5 zeroes and P3 is measured over the central 2UI of the run of 5 threes in the 0000033333 or 3333300000 sequences". Also change Table 139-10 page 296 line 16 from "Square wave" to "Square wave or 6"

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

See resolution to comment r03-44.

IEEE P802.3cd 50 Gb/s, 100 Gb/s, 200 Gb/s Ethernet 3rd Sponsor recirculation ballot comments

Cl 139 SC 139.7.7 P 299 L 34 # r03-13

Le Cheminant, Greg

Comment Type T Comment Status D <withdrawn>

The transmitter transition time measurement that has been added to optical transmitter specifications uses a square wave pattern of eight sequential 3's followed by eight sequential 0's. The long runs of symbols ensure stable amplitudes from which to derive the 20% and 80% signal level thresholds used to construct a transition time measurement. The TDECQ, OuterOMA, and extinction ratio measurements can be made from a single acquisition of the SSPRQ pattern. To simplify the transmitter test process, a transmitter transition time measurement should also be considered valid if performed on the SSPRQ pattern. In the SSPRQ pattern there are two 0000033333 and two 3333300000 sequences. A transition time measurement made on either of these sequences should be equivalent to the measurement made on the square wave pattern.

*SuggestedRemedy*

Change 139.7.7 line 34 from "".....using the test pattern....."" to "".....using a test pattern....."" And line 45 from "".....square wave test pattern is used."" to "".....square wave test pattern is used. When the SSPRQ pattern is used, P0 is measured over the central 2UI of the run of 5 zeroes and P3 is measured over the central 2UI of the run of 5 threes in the 0000033333 or 3333300000 sequences"

Proposed Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

Cl 139 SC 139.7.7 P 299 L 37 # r03-38

Dawe, Piers J G

Mellanox Technologie

Comment Type T Comment Status D

1. For consistency and so that transition time is a free by-product of a TDECQ measurement as intended by D3.2 comment 54, we should be able to measure transition time on the same pattern as other things, SSPRQ.
2. As it is intended to exclude signals that would cause receive equalizer issues (e.g. require better linearity and/or finer AtoD or tap resolution or stronger tap weights), what matters is a fitted signal, not the actual signal. So the limit can be based on the average of the rising and falling edges rather than the slower of them. Then, with a more consistent measurement, the limit can be tightened a little.
3. We should consider tightening the limit for 50GBASE-FR and 50GBASE-LR; it's the same as for MMF with a slower observation bandwidth and much higher TDECQ.

*SuggestedRemedy*

1. Add PRBS13Q and SSPRQ options for transition time measurement and associated P0 and P3: define the places in the patterns to measure, change the entry in Table 139-10, Test-pattern definitions and related subclauses, from "Square wave" to "4, 6 or square wave". If that doesn't work, consider changing to a maximum cursor strength limit, which really is a free by-product of a TDECQ measurement.
2. Change "the slower of the time interval of the transition from 20% ..., or from 80% ..." to "the average of the time intervals of the transition from 20% ..., and from 80% ...".
3. Reduce 34 ps to 28-32 ps TBD, considering the effect of the different observation bandwidth.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

See resolution to comment r03-33.

IEEE P802.3cd 50 Gb/s, 100 Gb/s, 200 Gb/s Ethernet 3rd Sponsor recirculation ballot comments

Cl 140 SC 140.6 P 318 L 42 # r03-42  
 Liu, Hai-Feng Intel Corporation

Comment Type TR Comment Status D

The primary benefit of introducing threshold adjustment in D3.2 was to improve the TDECQ and link BER penalty correlation. This change would also relax the TDECQ for those Tx with unequal sub-eyes. In D3.3, TDECQmax was reduced to keep the maximum sub-eye inequality no greater than before threshold adjustment was added. However, the proposed 0.4 dB reduction from 3.4 dB to 3 dB was based on the simulation/measurement for the worst symmetric eye compression case under 1% threshold adjustment. Applying the same 0.4 dB reduction in TDECQ max across the board will unnecessarily penalize a large portion of good Tx that would have nearly equal sub-eyes. These Tx will gain little in terms of TDECQ from the threshold adjustment, but the 0.4 dB reduction in TDECQmax will result in significant loss. In addition, the worst symmetric eye compression case is far from practical as it can be avoided at least for MZI and EML based Tx.

*SuggestedRemedy*

- In Table 140-6, change "TDECQ (max)" of 100GBASE-DR from 3 dB to 3.4 dB.
- In Table 140-7, change "stressed receiver sensitivity ... (max)" of 100GBASE-DR from -2.3 dB to -1.9 dB.
- In Table 140-7, change foot note "c" from "... SECQ up to 3 dB." to "... SECQ up to 3.4 dB."
- In Table 140-8, change "Power budget" of 100GBASE-DR for extinction ratio >= 5 dB from 6.1 dB to 6.5 dB.
- In Table 140-7, change the Stressed eye closure for PAM4 (SECQ) from 3 dB to 3.4 dB
- In Table 140-8, change "Power budget" of 100GBASE-DR for extinction ratio < 5 dB from 6.4 dB to 6.8 dB.
- In Table 140-8, change "Allocation for penalties" of 100GBASE-DR for extinction ratio >= 5 dB from 6.1 dB to 6.5 dB.
- In Table 140-8, change "Allocation for penalties" of 100GBASE-DR for extinction ratio < 5 dB from 6.4 dB to 6.8 dB.
- In page 323, 140.7.9, Change "...SECQ up to 3 dB" to "...SECQ up to 3.4 dB"

Proposed Response Response Status W

PROPOSED REJECT.

See response to r03-21.

Cl 140 SC 140.6 P 318 L 42 # r03-22  
 Tamura, Kohichi Oclaro

Comment Type TR Comment Status D

In D3.2, 1% OMA threshold adjustment was introduced to the TDECQ algorithm in order to improve the yields of transmitters with slightly unequal eye levels and to improve correlation between changes in TDECQ and receiver sensitivity. Real receivers have threshold adjustment capability exceeding 1%, so the changes will mainly benefit transmitters with some nonlinearity, such as DML, but not adversely impact receivers. However, in D3.3, TDECQ (max) of 100GBASE-DR reduced from 3.4 dB to 3 dB, which negated the improvement gained with threshold adjustment. Furthermore, highly linear transmitters, for which TDECQ is the same with or without threshold adjustment, were penalized by a reduction in TDECQ (max) by 0.4 dB.

*SuggestedRemedy*

- In Table 140-6, change "TDECQ (max)" of 100GBASE-DR from 3 dB to 3.4 dB.
- In Table 140-7, change "stressed receiver sensitivity ... (max)" of 100GBASE-DR from -2.3 dB to -1.9 dB.
- In Table 140-7, change foot note "c" from "... SECQ up to 3 dB." to "... SECQ up to 3.4 dB."
- In Table 140-7, change the "Stressed eye closure for PAM4 (SECQ)" from 3 dB to 3.4 dB
- In Table 140-8, change "Power budget" of 100GBASE-DR for extinction ratio >= 5 dB from 6.1 dB to 6.5 dB.
- In Table 140-8, change "Power budget" of 100GBASE-DR for extinction ratio < 5 dB from 6.4 dB to 6.8 dB.
- In Table 140-8, change "Allocation for penalties" of 100GBASE-DR for extinction ratio >= 5 dB from 6.1 dB to 6.5 dB.
- In Table 140-8, change "Allocation for penalties" of 100GBASE-DR for extinction ratio < 5 dB from 6.4 dB to 6.8 dB.
- In 140.7.9, change "...SECQ up to 3 dB" to "...SECQ up to 3.4 dB"
- In 140.7.9, change Figure 140-5 so curve includes up to SECQ of 3.4 dB.

Proposed Response Response Status W

PROPOSED REJECT.

See response to r03-21

IEEE P802.3cd 50 Gb/s, 100 Gb/s, 200 Gb/s Ethernet 3rd Sponsor recirculation ballot comments

Cl 140 SC 140.7.1 P 321 L 5 # r03-10  
 Stassar, Peter Huawei Technologies

Comment Type ER Comment Status D <bucket>

In 3 instances in Table 140-10, 50GBASE-R is mentioned, which should be 100GBASE-R.  
 Thanks to David Lewis for identifying this error.

SuggestedRemedy

Where applicable in Table 140-10 change "50GBASE-R" to "100GBASE-R"

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Implement proposed remedy with editorial license.

Cl 140 SC 140.7.1 P 321 L 17 # r03-17  
 Dudek, Michael Cavium

Comment Type TR Comment Status D <bucket>

Measuring RIN with pattern 4 using the measurement methodology of 52.9.6 will result in the wrong result.

SuggestedRemedy

Change the pattern to "square wave" (as is already used in Clauses 138 and 139).

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 140 SC 140.7.2 P 321 L 17 # r03-16  
 Le Cheminant, Greg

Comment Type T Comment Status D <withdrawn>

See above

SuggestedRemedy

Change "Square wave" to "Square wave or 6"

Proposed Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

Cl 140 SC 140.7.5 P 322 L 25 # r03-40  
 Dawe, Piers J G Mellanox Technologie

Comment Type TR Comment Status D

In this draft, it is still possible to make a bad SMF transmitter with emphasis (e.g. with a distorted signal) that even an equalizer better than the reference equalizer won't be able to improve. Note the receiver is tested for a slow signal only, not for such signals. But notice that in the survey (e.g. daw\_3cd\_01b\_0518 slide 8), the 100G SMF points are to the right or near neutral, not at the upper left.

We need to exclude unnecessary regions, too high up the TDECQ map, that would waste equalizer power and complexity.

D3.0 comment 116, D3.1 comment 71, D3.2 comment 52.

SuggestedRemedy

Limit TDECQ  $-10 \cdot \log_{10}(C_{eq})$  to the the max. TDECQ.

E.g. for a SMF TDECQ limit of 3 dB (100GBASE-DR), limit TDECQ  $-10 \cdot \log_{10}(C_{eq})$  to 3 dB; if it is increased to 3.4 dB, limit TDECQ  $-10 \cdot \log_{10}(C_{eq})$  to 3.4 dB.

Add the limit to the transmitter and receiver (conditions of stressed receiver sensitivity test) tables if appropriate.

This limit protects the equalizer and decision circuit or A to D from worse than reasonable waveforms, while OMA-TDECQ protects the receiver front end from excessive sensitivity demands.

Proposed Response Response Status W

PROPOSED REJECT.

See resolution to comment r03-36.

IEEE P802.3cd 50 Gb/s, 100 Gb/s, 200 Gb/s Ethernet 3rd Sponsor recirculation ballot comments

Cl 140 SC 140.7.7 P 323 L 6 # r03-15  
 Le Cheminant, Greg

Comment Type T Comment Status D <withdrawn>

The transmitter transition time measurement that has been added to optical transmitter specifications uses a square wave pattern of eight sequential 3's followed by eight sequential 0's. The long runs of symbols ensure stable amplitudes from which to derive the 20% and 80% signal level thresholds used to construct a transition time measurement. The TDECQ, OuterOMA, and extinction ratio measurements can be made from a single acquisition of the SSPRQ pattern. To simplify the transmitter test process, a transmitter transition time measurement should also be considered valid if performed on the SSPRQ pattern. In the SSPRQ pattern there are two 0000033333 and two 3333300000 sequences. A transition time measurement made on either of these sequences should be equivalent to the measurement made on the square wave pattern.

*SuggestedRemedy*

Change 140.7.7 line 6 from "".....using the test pattern....."" to "".....using a test pattern....."" And line 17 from "".....square wave test pattern is used."" to "".....square wave test pattern is used. When the SSPRQ pattern is used, P0 is measured over the central 2UI of the run of 5 zeroes and P3 is measured over the central 2UI of the run of 5 threes in the 0000033333 or 3333300000 sequences"

Proposed Response Response Status Z

REJECT.

This comment was WITHDRAWN by the commenter.

Cl 140 SC 140.7.7 P 323 L 6 # r03-46  
 Le Cheminant, Greg

Comment Type T Comment Status D

The transmitter transition time measurement that has been added to optical transmitter specifications uses a square wave pattern of eight sequential 3's followed by eight sequential 0's. The long runs of symbols ensure stable amplitudes from which to derive the 20% and 80% signal level thresholds used to construct a transition time measurement. The TDECQ, OuterOMA, and extinction ratio measurements can be made from a single acquisition of the SSPRQ pattern. To simplify the transmitter test process, a transmitter transition time measurement should also be considered valid if performed on the SSPRQ pattern. In the SSPRQ pattern there are two 0000033333 and two 3333300000 sequences. A transition time measurement made on either of these sequences should be equivalent to the measurement made on the square wave pattern.

*SuggestedRemedy*

Change 140.7.7 line 6 from "".....using the test pattern....."" to "".....using a test pattern....."" And line 17 from "".....square wave test pattern is used."" to "".....square wave test pattern is used. When the SSPRQ pattern is used, P0 is measured over the central 2UI of the run of 5 zeroes and P3 is measured over the central 2UI of the run of 5 threes in the 0000033333 or 3333300000 sequences". Also change Table 140-10 Page 321 line 16 from "Square wave" to "Square wave or 6"

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

See response to comment r03-44.

IEEE P802.3cd 50 Gb/s, 100 Gb/s, 200 Gb/s Ethernet 3rd Sponsor recirculation ballot comments

Cl 140 SC 140.7.7 P 323 L 9 # r03-41  
 Dawe, Piers J G Mellanox Technologie

Comment Type T Comment Status D

1. For consistency and so that transition time is a free by-product of a TDECQ measurement as intended by D3.2 comment 54, we should be able to measure transition time on the same pattern as other things, SSPRQ.
2. As it is intended to exclude signals that would cause receive equalizer issues (e.g. require better linearity and/or finer AtoD or tap resolution or stronger tap weights), what matters is a fitted signal, not the actual signal. So the limit can be based on the average of the rising and falling edges rather than the slower of them.

*SuggestedRemedy*

1. Add PRBS13Q and SSPRQ options for transition time measurement and associated P0 and P3: define the places in the patterns to measure, change the entry in Table 140-10, Test-pattern definitions and related subclauses, from "Square wave" to "4, 6 or square wave". If that doesn't work, consider changing to a maximum cursor strength limit, which really is a free by-product of a TDECQ measurement.
2. Change "the slower of the time interval of the transition from 20% ..., or from 80% ..." to "the average of the time intervals of the transition from 20% ..., and from 80% ...".

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

See response to r03-33.

Cl 140 SC 140.7.10 P 324 L # r03-8  
 Stassar, Peter Huawei Technologies

Comment Type TR Comment Status D <bucket>

140.7.10 should have an exception to use Figure 139-7 because it is a single lane PMD, in a similar way as in Subclause 139.7.10.2

*SuggestedRemedy*

Add another exception, "An example stressed receiver conformance test setup is shown in Figure 139-7; however, alternative test setups that generate equivalent stress conditions may be used."

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 140 SC 140.7.10 P 324 L 47 # r03-7  
 Stassar, Peter Huawei Technologies

Comment Type TR Comment Status D

An exception, referring to test patterns in Table 140-10, is missing.

*SuggestedRemedy*

Add another exception "The test patterns used for stressed receiver sensitivity are specified in Table 140-10."

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

To be consistent with 139.7.10, change the first sentence of 140.7.10, to read:  
 "Stressed receiver sensitivity shall be within the limits given in Table 140-7 if measured using the method defined in 121.8.9, using the test pattern specified for SRS in Table 140-10, with the following exceptions: "