Cl **01** *SC* *P* *L* # **1**

Wali Rousta

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

Hi
I want to know why I cannot view all the edited pages per our last meeting in Irvine.
Thanks

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **06** *SC* **6.1** *P* **6.1** *L* **1** # **23**

Bill Lane CSU Chico

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

The statement, "The PLS service primitives provided by the Reconciliation sublayer, and described here, behave in exactly the same manner as defined in clause 6.", is not completely correct. When the PLS_xxx.indication primitives were changed to PLS_xxx.indicate primitives in the just-published 802.3x and y, not all instances of "indication" were changed to "indicate".

SuggestedRemedy

6.2.3 - All enumerated PLS_xxx.indication primitives need to be changed to PLS_xxx.indicate - 4 places.

6.2.1.2 - PLS_DATA.indication in the subclause title should be changed to PLS_DATA.indicate.

6.3.1.2.3 - In the note, indication should be changed to indicate.

6.3.2.3 - PLS_DATA_VALID.indication in the subclause title should be changed to PLS_DATA_VALID.indicate.

6.3.2.3.2 - PLS_DATA_VALID.indication should be changed to PLS_DATA_VALID.indicate.

6.3.2.3.3 - PLS_DATA_VALID.indication should be changed to PLS_DATA_VALID.indicate.

I do not know whether these correction should be made in 802.3z or whether they should be added to the list of things to be done when all of these supplements are merged into the next edition of the base standard. Either is OK, but approval of 802.3z should not be delayed.

It is a good standard and you are to be congratulated. Well done.

Proposed Response *Response Status* **O**

Cl **35** *SC* **35.1.4** *P* **35.4** *L* **39** # **18**

howard frazier cisco systems, inc

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

"maximize" should be "maximizes".

SuggestedRemedy

Change "maximize" to "maximizes".

Proposed Response *Response Status* **O**

Cl **35** *SC* **35.4.2.1** *P* **35.23+** *L* # **2**

Brad Booth Jato Technologies

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

Figures 35-17, 35-18, 35-19, 35-20 and 35-21 sit in the middle of the paragraph.

SuggestedRemedy

Move figures to be between paragraphs.

Proposed Response *Response Status* **O**

Cl **36** *SC* **36.2.5.1.3** *P* **36.22** *L* **9** # **24**

Joe Kryzak Gigether

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

My question is enabling cgbad vs. cggood, in respect to the synchronization state machine. For example, in the state sync_acquired_1 on page 36.34, there are two next states, one enabled by cggood, the other by cgbad. My understanding is that both of these can be enabled at the same time. Is cgbad to have priority? If I receive a valid comma in that state while rxeven is true, what would the next state be? Both cggood and cgbad would be enabled!

SuggestedRemedy

1. Explain why a code group is "bad" or "good" because you are receiving a valid comma when rxeven is true. It's obvious why a invalid code group is considered bad, but when you OR it with the comma and the rxeven function, it becomes vague.
2.The titles cggood and cgbad imply a binary relationship, where one is the opposite of the other. Pick a name that incorporates priority.

Proposed Response *Response Status* **O**

Cl **36** *SC* **36.2.5.1.3** *P* **36.22** *L* **9** # **41**

Joe Kryzak gigether

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

Please withdraw my previous comment (my error!):

My question is enabling cgbad vs. cggood, in respect to the synchronization state machine. For example, in the state sync_acquired_1 on page 36.34, there are two next states, one enabled by cggood, the other by cgbad. My understanding is that both of these can be enabled at the same time. Is cgbad to have priority? If I receive a valid comma in that state while rxeven is true, what would the next state be? Both cggood and cgbad would be enabled!

SuggestedRemedy

Proposed Response *Response Status* **O**

Cl **36** *SC* **36.2.5.1.6** *P* **36.27** *L* **13** # **8**

Brad Booth Jato Technologies

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

PMA_UNITDATA.request is not sent by the PMA Transmit process, it is sent to the PMA Transmit process.

SuggestedRemedy

Change to read:
"A signal sent to the PMA Transmit process conveying the next code-goup ready for transmission over the medium (see 36.3.1.1)."

Proposed Response *Response Status* **O**

Cl **36** *SC* **36.2.5.2.1** *P* **36.29** *L* # **9**

Brad Booth Jato Technologies

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

PMA_UNITDATA.request is not sent by the PMA Transmit process, it is sent to the PMA Transmit process. The current state machine diagrams treats PMA_UNITDATA.request as an input to the transmit code-group state machine when in fact it should be generated by the state machine, as is done in clause 23 and clause 40.

SuggestedRemedy

Add the following line to the last line of each state that assigns a value to tx_code_group:
"PMA_UNITDATA.request(tx_code_group)"

Change PMA_UNITDATA.request on all state transition arrows to read:
"cg_timer_done"

Add new section on page 36.27 to read:
"36.2.5.1.7 Timer"

cg_timer

A continuous free-running timer.

Values: The condition cg_timer_done goes true upon timer expiration.

Restart when: Immediately after expiration; restarting the timer resets the condition cg_timer_done.

Duration: 8 ns nominal.

cg_timer shall be generated synchronously with GTX_CLK (see tolerance required for GTX_CLK in 35.4.2.3. In the PCS transmit code-group state diagram, the message PMA_UNITDATA.request is issued concurrently with cg_timer_done."

Proposed Response *Response Status* **O**

Cl **36** *SC* **36.3.1.1** *P* **36.35** *L* **41** # **10**

Brad Booth Jato Technologies

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

PMA_UNITDATA.request is not used by the PCSTransmit process, it is generated by the PCS Transmit process.

SuggestedRemedy

Change sentence to read:
"PMA_UNITDATA.request is generated by the PCS Transmit process."

Proposed Response *Response Status* **O**

Cl **36** *SC* **36.3.2.2** *P* **36.37** *L* **9** # **11**

Brad Booth Jato Technologies

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

Previous comment requesting addition of cg_timer will define the clock frequency of PMD_UNITDATA.request.

SuggestedRemedy

Delete the sentence.

Update the PICS entry PMT1 to reference subclause 36.2.5.1.7.

Proposed Response *Response Status* **O**

Cl **36** *SC* **Figure 36-7a, 36-7b** *P* **36.30** *L* # **14**

Chandra Moturu Compaq Computer Co

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

Shape of polygons to indicate "outgoing" arcs is confusing as their pointed end is facing "incoming".

SuggestedRemedy

Change shape of polygons (labeled A on page 36.30 and B,C,D on page 36.31) where the pointing end faces toward the bottom of the page, as indicated below.

```
 __
| A|
\  /
 \/
```

Proposed Response *Response Status* **O**

Cl **37** *SC* **37.2.4.2** *P* **37.9** *L* **15** # **16**

howard frazier cisco systems, inc

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

"Pause priority resolution" is a inappropriate term, since the resolution of the pause configuration does not depend on any relative prioritization of the configuration options.

SuggestedRemedy

Reword the second paragraph of 37.2.4.2 as follows:

Priority resolution is supported for the full and half duplex modes of operation. Full duplex shall have priority over half-duplex. Resolution of the pause capability shall be resolved as specified by table 37-4. Resolution which precludes operation....{remainder unchanged}

Change the title of table 37-4 to read:

Table 37-4-- Pause capability resolution

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.10** *P* **38.18** *L* **38** # **44**

Joe Gwinn Raytheon

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

Precisely how do Figure 38-1 (1000BASE-X block diagram) and Figure 38-7 (Optical Channel cabling model) tie together? Clearly, they must, but the dots are not connected, instead being left to the imagination of the public, not a good idea.

SuggestedRemedy

On Figure 38-1, show where the "MDI" blocks or interfaces are.

On Figure 38-7, show where the various test points and bulkheads are.

An accountant should be able to correlate the two drawings.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.10** *P* **38.18** *L* **40** # **21**

howard frazier cisco systems, inc.

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

The reference to "channel insertion loss" seems incorrect, since table 38-11 lists "channel attenuation", and the values are different from the "channel insertion loss" shown in other tables. If "Channel insertion loss" is the correct term, then the values in the table appear to be wrong. If the values are actually supposed to represent "channel attentuation", then the reference to "channel insertion loss" in this paragraph, and in the title of the table, should be changed to "channel attenuation".

SuggestedRemedy

Either:

1) Change "channel insertion loss" to "channel attenuation" in the text and in the table title, or

2) Change "channel attenuation" to "channel insertion loss" in column 1, row 4 of table 38-11, and correct the values in row 4.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.10** *P* **38.19** *L* **1-14** # **60**

Dan Brown AMP

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

Table 38-11 contains absolutely no new information and is completely redundant with tables 38-5 and 38-9. Table 38-11 causes confusion because it uses different terminology than tables 38-5 and 38-9 to describe identical parameters. For example:

Tables 38.5 and 38.9 use the terms "operating distance" and "channel insertion loss" while Table 38-11 uses the terms "link length" and "channel attenutation".

SuggestedRemedy

Suggest deleting Table 38-11 in its entirety. Global change references to Table 38-11 to "tables 38-5 and 38-9" (specific references contained in clauses 38.10, 38.11.2.1, and 38.11.2.2).

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.10** *P* **38.19** *L* **13** # **79**

Paul Kolesar Lucent Technologies

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

Note b. is obtuse. The link lengths referred to are included within the associated table, Table 38-11. No reference to other tables is necessary, and doing so causes confusion.

SuggestedRemedy

Change Note b. to read:
"Link lengths used to calculate channel attenuation are those specified in this table."
An alternative is to delete Note b. and change the "Link length" row heading to "Link length of calculation".

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.10** *P* **38.19** *L* **7** # **78**

Paul Kolesar Lucent Technologies

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

Specification for 50 micron 1300 nm bandwidth is unclear. The present style can be misinterpreted to be an 850/1300 nm spec.

SuggestedRemedy

Change "400/500" to "400 or 500".

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.10** *P* **38.19** *L* **9** # **22**

howard frazier cisco systems, inc.

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

Inconsistent use of the terms "operating distance" and "link length" when referring to the same value.

SuggestedRemedy

Use "operating distance" in table 38-11, row 3.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.11** *P* **38.19** *L* **16** # **29**

Steven E. Swanson Corning Inc.

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

This subclause really defines the optical cable plant and should be defined that way.

SuggestedRemedy

Change the title to read: "38.11 Characteristics of the optical cable plant"

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.11** *P* **38.19** *L* **19-22** # **30**

Steven E. Swanson Corning Inc.

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

The current wording is confusing and unclear.

SuggestedRemedy

Reword this section as follows:

"The 1000BASE-SX and 1000BASE-LX optical cable plant shall meet the specifications defined in Table 38-12. The optical cable plant consists of one or more sections of fiber optic cable and any intermediate connections required to connect sections together. It also includes a connector plug at each end to connect to the MDI. The optical cable plant spans from one MDI to another MDI as shown in Figure 38-7."

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.11** *P* **38.20** *L* **50** # **80**

Paul Kolesar Lucent Technologies

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

The last two rows are presented out of sequence. The Dispersion slope row uses symbology for "lambda sub zero" that is not introduced until the next row in the table. It is logical to place the Zero dispersion wavelength row before the Dispersion slope row.

SuggestedRemedy

Swap the row order of the Dispersion slope and Zero dispersion wavelength rows.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.11.1** *P* **38.19** *L* **26** # **31**

Steven E. Swanson Corning Inc.

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

Tie text to figures where possible.

SuggestedRemedy

Change from "optical medium" to "optical cable plant" consistent with Figure 38-7.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.11.1** *P* **38.20** *L* **11** # **17**

howard frazier cisco systems, inc

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

While I fully support the inclusion of two modal bandwidth cells for both 50 um and 62.5 um fiber, I do not think that it is necessary to include both the low bandwidth cell and the higher bandwidth cell for each fiber in table 38-12.

The "Modal Bandwidth (min; overfilled launch)" row in table 38-12 should truly reflect the minimum performance of the cable, which is 160/500 for 62.5 and 400/400 for 50 um fiber respectively. The other tables in clause 38 accurately represent the link characteristics for the different grades of multimode fiber.

SuggestedRemedy

Delete the second row of modal bandwidth values in table 38-12.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.11.2** *P* **38.19 and 3** *L* **32-55 and** # **32**

Steven E. Swanson Corning Inc.

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

As written, significant confusion will exist between "connections" and "interfaces." Separate definitions are needed and recommended.

SuggestedRemedy

Reword this subclause as follows:

"38.11.2 Optical fiber connection

An optical fiber connection as shown in Figure 38-7 consists of a pair of connector plugs mated through a connector adaptor. The 1000BASE-SX and 1000BASE-LX PMD is coupled to the optical cable plant through a connector plug into the MDI optical receptacle (see 38.11.3).

38.11.2.1 Connection insertion loss

The insertion loss is specified for a connection, which consists of a pair of connector plugs mated through a connector adaptor.

[Insert text from current 38.11.2.1]

[Insert text from current 38.11.2.2]

38.11.2.2 Connection return loss

[Insert text from current 38.11.2.3]

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.11.2.1** *P* **38.20** *L* **14** # **52**

Joe Gwinn Raytheon

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

The lower modal-bandwidth cell for 1310-nm SMF is empty, while the upper cell contains a "N/A". To be perfectly clear and consistent, the empty cell should be filled.

SuggestedRemedy

Either add a "N/A" in the empty cell, or delete the horizontal line between the current N/A and blank cells, so the N/A will apply to both.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.11.2.4** *P* **38.20** *L* **47** # **15**

Bob Musk Hewlett Packard

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

Figure 38.8 - 1000BASE-LX Offset mode conditioning patchcord assembly. Some confusion related to keying features of the SC Duplex connector in this figure have been observed. Keying features are not identified in this drawing.

SuggestedRemedy

Propose that the existing figure is replaced with an improved drawing to identify the keying features of the SC connectors. A suitable drawing has been prepared and is available upon request. It will also be presented at the Interim meeting.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.11.2.4** *P* **38.21** *L* **23** # **54**

Joe Gwinn Raytheon

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

I think we want to ask that it be made difficult for a user to take one of these mode conditioning patch cords apart without destroying it, to prevent curious users from discombobulating our careful little offsets, which are of order the diameter of human hair, and thus hard to see.

SuggestedRemedy

Add a sentence strongly suggesting that mode conditioning patch cords be made in such a manner as to make them quite difficult to disassemble without destroying them, to ensure survival of the careful offsets in the face of day to day bumps, and the curious.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.11.2.4** *P* **38.21 and 3** *L* **16-55 and** # **34**

Steven E. Swanson Corning Inc.

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

Since the mode conditioning patch cord is a special connection, create a separate subclause.

SuggestedRemedy

Create 38.11.4, "Mode conditioning patch cord for MMF operation of 1000BASE-LX"

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.11.2.4** *P* **38.22** *L* **6-13** # **35**

Steven E. Swanson Corning Inc.

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

Since polarity is important for the mode conditioning patchcord, the drawing should show the key location.

SuggestedRemedy

Use a plug drawing similar to that in Figure 38-9 for Figure 38-8.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.11.2.4** *P* **38.22** *L* **9** # **53**

Joe Gwinn Raytheon

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

Figure 38-8 is somewhat confusing, because the same style of heavy dashed line has been used to signify two very different things, multimode fiber and mechanical connection between SC connector paths.

SuggestedRemedy

Use some other drawing symbology to signify mechanical connection, a symbology that does not resemble any of the fiber paths. Probably, two thin lines joining the path bodies (which contain TX and RX) would work.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.11.3** *P* **38.22** *L* **17** # **33**

Steven E. Swanson Corning Inc.

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

As written, significant confusion will exist between "connections" and "interfaces." Separate definitions are needed and recommended.

SuggestedRemedy

Reword this subclause as follows:

"38.11.3 Media Device Interface (MDI)

The 1000BASE-SX and 1000BASE-LX PMD is coupled to the optical cable plant through a connector plug into the MDI optical receptacle. The 1000BASE-SX and 1000BASE-LX MDI optical receptacle shall be the duplex SC, meeting the following requirements:

a) meet the dimension and interface specifications of IEC 61754-4 and IEC 61754-4 Part 4.2
b) meet the performance specifications as specified in IS 11801
c) ensure that polarity is maintained
d) the receive side of the receptacle is located on the left when viewed looking into the transceiver optical ports with the keys on the bottom surface.

A sample drawing of a duplex SC connector plug and an MDI optical receptacle is provided in Figure 38-9.

[Insert Figure 38-9]"

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.12.4.2** *P* **38.26** *L* **12** # **36**

Steven E. Swanson Corning Inc.

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

Item PMS3 on launch power is redundant with PMS1 since the transmitter shall meet all specifications defined in Table 38-3 and launch power is one of them.

SuggestedRemedy

Delete PMS3.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.12.4.5** *P* **38.30** *L* **11** # **38**

Steven E. Swanson Corning Inc.

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

Consistent with my comments clarifying the difference between a "connection" and "interface" in 38.11.3 above, a connection necessarily requires two plugs and an adaptor or a plug and receptacle.

SuggestedRemedy

Change L12 to read: "MDI optical receptacle"

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.12.4.5** *P* **38.30** *L* **6** # **37**

Steven E. Swanson Corning Inc.

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

Consistent with my comments clarifying the difference between a "connection" and "interface" in 38.11.3 above, a connection necessarily requires two plugs and an adaptor or a plug and receptacle.

SuggestedRemedy

Change L11 to read: "MDI optical plug"

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.2.1** *P* **38.4** *L* **21** # **43**

Joe Gwinn Raytheon

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

Precisely how do Figure 38-1 (1000BASE-X block diagram) and Figure 38-7 (Optical Channel cabling model) tie together? Clearly, they must, but the dots are not connected, instead being left to the imagination of the public, not a good idea.

SuggestedRemedy

On Figure 38-1, show where the "MDI" blocks or interfaces are.

On Figure 38-7, show where the various test points and bulkheads are.

An accountant should be able to correlate the two drawings.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.2.4** *P* **38.4** *L* **35** # **7**

howard frazier cisco systems

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

The text and table describing the Signal Detect function is unnecessarily complex, and subject to misinterpretation. The essential requirements are not obvious, and there is a certain amount of redundancy.

SuggestedRemedy

Replace all of 38.2.4 with the following:

38.2.4 PMD signal detect function

The PMD Signal Detect function shall report to the PMD service interface, using the message PMD_SIGNAL.indicate(SIGNAL_DETECT) which is signaled continuously. PMD_SIGNAL.indicate is intended to be an indicator of optical signal presence.

The SIGNAL_DETECT parameter shall be set to FAIL under the conditions defined in Table 38-1. The SIGNAL_DETECT parameter shall be set to OK under the conditions defined in Table 38-1, provided that the optical input is generated by an appropriate optical transmitter which is transmitting 1000BASE-X code-groups as defined in this standard.

Under all other conditions, the value of the SIGNAL_DETECT parameter is unspecified. This standard imposes no response time requirements on the generation of the SIGNAL_DETECT parameter.

Table 38-1 SIGNAL_DETECT value definition

Receive Conditions	Value
Input optical power < -30dBm	FAIL
-30dBm < Input optical power < Receive Sensitivity	unspecified
Input optical power > Receive Sensitivity	OK

As an unavoidable consequence of the requirements for the setting of the SIGNAL_DETECT parameter, implementations must provide adequate margin between the input optical power level at which the SIGNAL_DETECT parameter is set to OK, and the inherent noise level of the PMD due to cross talk, power supply noise, etc.

Various implementations of the Signal Detect function are permitted by this standard, including implementations which generate the SIGNAL_DETECT parameter values in response to the amplitude of the 8B/10B modulation of the optical signal and implementations which respond to the average optical power of the 8B/10B-modulated optical signal.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.2.4** *P* **38.4** *L* **39** # **4**

Pat Gilliland Methode Electronics

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

Regarding clause 38.2.4 (PMD signal detect function) lines 39-40 state,

"SIGNAL_DETECT shall be set to OK when the circuitry receives a valid optical signal."

1.0 Unfortunately, most optical transceivers already have a Signal_Detect output. Signal_Detect as implemented in these transceivers cannot reliably indicate the presence of a "valid optical signal". Therefore, we need to take some steps to avoid confusion.

If you are well versed in the subject of communications system design, you may want to skip or merely scan the material between the dotted lines and go right to the conclusion.

1.1 There are two basic types of signal detect circuits. Both types of signal detect circuitry are insufficient to reliably establish the presence of a "valid optical signal". Some Signal_Detect outputs simply indicate the presence of light above a certain level. These circuits are very easy to design and implement. They only require a bias resistor, a reference voltage and a comparator. They will still respond positively even if there is no modulation of the optical input (i.e. CW optical input).

1.2 Another type of signal detect responds to the amplified electrical output of the optical detector. These are further divided into three subgroups. The first is a simple AC rectifier circuit which compares the AC rectified voltage against the DC average value of the detected and amplified optical input. When the difference exceeds a certain threshold, a comparator sets the SD logical output to "TRUE".

1.2.1 Type 1 as described above suffers from a different problem. If there is no optical modulation, the circuit could respond to random noise or spurious signals generated in the receiver amplifier chain. Because the receiver needs to respond to optical signals at or below 10uW, there is a tremendous amount of power gain (in a typical receiver ~ 60dB) depending on the choice of AGC or limiting amplifier. Since the Type 1 SD circuit cannot discriminate between noise, spurious signals (oscillations) and valid optical pulses, it is possible for the Type 1

SD to generate false positives.

1.2.2 Type 2 attempts to resolve some of the problems of the Type 1 circuit by adding a matched filter to the AC rectifier circuit. This optimal bandpass filter passes the 800ps GbE pulse relatively unattenuated, and filters out noise and spurious signals not in the passband of the filter. This type of circuit greatly increases the reliability of the SD logic.

Of course, Type 2 has its limits. None of the currently available optical transceivers employ such a filter. Additionally, not all valid optical pulses are 800ps in duration. By choosing the appropriate time constant for the AC rectifier circuit, we can deal with this problem.

More worrisome is the potential for auto-induced false triggers of the SD detect output in a transceiver module. Because of the very high gains in the small package, there is the possibility of crosstalk from the transmitter coupling into the receiver chain and triggering the SD comparator.

1.2.3 Type 3 adds circuitry to detect a characteristic pattern in the signal. In addition to the matched filter, we can add a multi input AND gate which looks in parallel at the serial data output as it streams by. When a common pattern is detected (e.g. K28.5), the SD logic is set to "TRUE". This type of SD circuit has the greatest processing gain of all, and is inherently the most reliable.

Even the Type 3 has limitations which make it in practice no better than the Type 2 when implemented inside the small optical transceivers common in today's implementations. Because of the intimate association of an optical transmitter and receiver in a small package, a degree of cross coupling can be expected. The high gain of the receiver creates the possibility of a false SD "TRUE" output.

Since none of the present transceiver manufacturers implement the more reliable Type 2&3 circuits anyway, we must distinguish between the SD as presently implemented and the one which is desired to be "set to OK when the PMD circuitry receives a valid optical signal."

SuggestedRemedy

1.3 I propose the following solution. Leave Signal_Detect as it is. Since it is defined somewhat differently by all the transceiver manufacturers anyway, allow each to implement it according to their current rules.

If we use the capabilities of our SERDES chips we have both the Type 2&3 Signal_Detect already implemented. Deserializers implement clock recovery with a phase locked loop. Most of these PLLs use a phase-frequency discriminator. Most also have a Lock_Detect output which indicates if the PLL has acquired phase lock on the incoming signal. This is the equivalent of a Type 2 SD as described above. The PLL is operating as a high quality synchronous filter (translate: bandpass filter in the frequency domain). Therefore, Lock_Detect indicates the presence of 800ps pulses.

Deserializers also commonly implement a Comma_Detect circuit to assist in framing. This type of data pattern detect is the same as Type 3 described above.

Ultimately, the most reliable Signal_Detect would be a logical combination of an optical power detect from the optical module and the Lock_Detect and Comma_Detect outputs of the SERDES. I am not 100% sure all SERDES vendors employ a phase/frequency discriminator in their PLL circuits, so we could eliminate the Lock_Detect if it is not universal. We could also leave open the option of optical power detect or rectified AC signal detect since there is no universal agreement on this topic.

I propose we rename the 38.2.4 clause "PMD Signal Integrity" and define it as the logical "AND" of Comma_Detect from the SERDES and Signal_Detect from the optical transceiver.

Then it will be possible to claim as we desire in line 40 the existence of a "valid optical signal".

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.2.4** *P* **38.4** *L* **40** # **5**

Pat Gilliland, Methode Electronics

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

There is a major contradiction in the text in regard to received power threshold for SIGNAL_DETECT. In the current document it states on page 38.4 line 40,

"SIGNAL_DETECT shall be set to FAIL when the received optical power is below -30 dBm."

In the table on page 38.5 line 22 there is note b which states,

"b. The SIGNAL_DETECT values in this table are generated by processing the 8B/10B character signal through an AC coupled receiver. The SIGNAL_DETECT values should respond to the amplitude of the 8B/10B modulation signal and not respond directly to the average optical power received."

These two statements are contradictory. In one place we are asking for a threshold which is based on the optical power of -30dBm, yet we specify in note b the SIGNAL_DETECT shall not respond to optical power.

The desired -30dBm limit is most certainly indicative of the average optical power. Optical power meters do not respond to peak power. Optical power meters do respond directly to average optical power.

SuggestedRemedy

Eliminate note b. The particular method used to derive the SIGNAL_DETECT power indication is of no consequence to the end user. The optical receiver vendors are responsible for engineering the necessary circuits. The preferrable way is a direct indication of optical power.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.2.4** *P* **38.4** *L* **41** # **6**

Pat Gilliland, Methode Electronics

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

The statement I object to is,

"Examples of a FAIL condition are when the link is unplugged or the transmitter to which it is attached is changed to the OFF state."

Any reference to an "OFF" state for the optical transmitter anticipates there is some mechanism for creating such a state.

The vast majority of optical transceivers being sold into the GbE market today have no such "OFF" control inputs.

SuggestedRemedy

Remove any references to an "OFF" state for an optical transmitter in the standard. Line 41 should read,

"An example of a FAIL condition is when the link is unplugged."

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.3** *P* **38.5** *L* **42** # **45**

Joe Gwinn, Raytheon

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

In Table 38-2, we fail to specify that by "modal bandwidth", we mean overfilled launch bandwidth as measured using TIA/EIA <whatever>, or even to mention overfilled launch. By contrast, Table 38-5 (on page 38.8) and Table 38-9 (page 38.10) do mention overfilled launch.

SuggestedRemedy

Add words to say, either directly or by reference, that we mean overfilled launch bandwidth as measured using TIA/EIA <whatever>.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.3** *P* **38.5** *L* **42** # **65**

Paul Kolesar Lucent Technologies

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

The heading of the second column does not indicate wavelength of parameter.

SuggestedRemedy

Change heading to read:
Modal Bandwidth @ 850 nm (MHz.km)

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.3.1** *P* **38.6** *L* **10** # **66**

Paul Kolesar Lucent Technologies

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

62.5 and 50 micron columns are redundant.

SuggestedRemedy

Simplify the table by merging the entries as was done for the average launch power row (line 21).

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.3.1** *P* **38.6** *L* **28 and 37** # **25**

Steven E. Swanson Corning Inc.

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

There is no requirement on SX for a conditioned launch. Therefore, the note to avoid radial overfilled launches is not needed. This note has also been deleted in Table 38-7 for the LX transmit characteristics.

SuggestedRemedy

Delete superscript d on CPR and delete the note d under Table 38-3.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.3.1** *P* **38.6** *L* **30** # **67**

Paul Kolesar Lucent Technologies

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

Note a. uses out dated terminology.

SuggestedRemedy

Change "maximum receive power" to "average receive power (max)".

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.3.2** *P* **38.7** *L* **14** # **68**

Paul Kolesar Lucent Technologies

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

"Value" heading unnecessary. Receive cutoff frequency entries redundant.

SuggestedRemedy

Delete Value heading. Merge cells with 1500 entries.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.3.2** *P* **38.7** *L* **27** # **56**

Dan Brown AMP

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

Inclusion of "Vertical eye closure penalty" in Table 38-4 is inconsistent with rest of table which specifies receiver characteristics. Vertical eye closure penalty is not a receiver characteristic, it is a test condition for measuring stressed receive sensitivity.

SuggestedRemedy

1) Remove Vertical eye closure penalty from Table 38-4 and add footnote "C" associated with Stressed receive sensitivity which states "Stressed receive sensitivity for 62.5 MMF measured with 2.6 dB vertical eye closure penalty. For 50 MMF, measured with 2.2 dB vertical eye closure penalty".
OR
2) Add footnote "C" associated with Vertical eye closure penalty which states "Vertical eye closure penalty is a test condition for measuring Stressed receive sensitivity. It is not a required characteristic of the receiver".

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.3.3** *P* **38.8** *L* **11** # **63**

Dan Brown AMP

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

Nowhere in the document is the term "channel insertion loss" clearly and concisely defined.

SuggestedRemedy

Add footnote "b" associated with Channel insertion loss row of table 38-5 which states "Channel insertion loss consists of the combined connection insertion losses and cable attenuation for the optical channel as defined in clause 38.10. Operating distances used to calculate channel insertion loss are the maximum values specified in Table 38-2."

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.4** *P* **38.8** *L* **22** # **46**

Joe Gwinn Raytheon

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

In Table 38-6, we fail to specify that by "modal bandwidth", we mean overfilled launch bandwidth as measured using TIA/EIA <whatever>, or even to mention overfilled launch. By contrast, Table 38-5 (on page 38.8) and Table 38-9 (page 38.10) do mention overfilled launch.

SuggestedRemedy

Add words to say, either directly or by reference, that we mean overfilled launch bandwidth as measured using TIA/EIA <whatever>.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.4** *P* **38.8** *L* **25** # **71**

Paul Kolesar Lucent Technologies

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

Wavelength of modal bandwidth is not specified.

SuggestedRemedy

Change column heading to "Modal bandwidth @ 1300 nm (MHz-km)"

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.4** *P* **38.8** *L* **5** # **69**

Paul Kolesar Lucent Technologies

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

Wavelength of modal bandwidth not specified.

SuggestedRemedy

Change "Modal Bandwidth (minimum, overfilled launch)" to "Modal bandwidth @ 850 nm (minimum, overfilled launch)".

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.4** *P* **38.8** *L* **9** # **70**

Paul Kolesar Lucent Technologies

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

"Wavelength" row heading is unclear.

SuggestedRemedy

Change heading to "Wavelength of calculations below" or delete row and add "@ 830 nm" to the end of each of the three row headings below it.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.4.1** *P* **38.9** *L* **2** # **72**

Paul Kolesar Lucent Technologies

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

Inconsistent terminology.

SuggestedRemedy

Change "singlemode fiber offset launch" to "mode conditioning hybrid".

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.4.1** *P* **38.9** *L* **29** # **73**

Paul Kolesar Lucent Technologies

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

Inconsistent terminology.

SuggestedRemedy

Delete "SMF offset-launch".

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.4.1** *P* **38.9** *L* **39** # **47**

Joe Gwinn Raytheon

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

The description of mode conditioning jumpers and their use is a bit confusing, as it seems to imply that one uses the offset-launch jumper fiber at both transmitter and at receiver, which is not correct, and thus appears to conflict with Figure 38-8 on page 38.22. In fact, the duplex jumper contains one ordinary fiber plus one mode-conditioning fiber.

SuggestedRemedy

Add the word "duplex" between "conditioning" and "hybrid", so the first sentence reads "... mode conditioning duplex hybrid patch cord, ...".

Add a sentence saying that only the outbound (transmit) fiber of the duplex does any mode conditioning at all, and that the inbound (receive) path is plain vanilla multimode fiber, and referencing Figure 38-8.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.4.1** *P* **38.9** *L* **7** # **76**

Paul Kolesar Lucent Technologies

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

Most values in Table 38-7 are redundant.

SuggestedRemedy

Simplify Table 38-7 by merging redundant cells across columns. Retain separate cells for entries with different values. See Table 38-4 for example.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.4.2** *P* **38.10** *L* **21** # **57**

Dan Brown AMP

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

Inclusion of "Vertical eye closure penalty" in Table 38-8 is inconsistent with rest of table which specifies receiver characteristics. Vertical eye closure penalty is not a receiver characteristic, it is a test condition for measuring stressed receive sensitivity.

SuggestedRemedy

1) Remove Vertical eye closure penalty from Table 38-8 and add footnote "C" associated with Stressed receive sensitivity which states "Stressed receive sensitivity measured with 2.6 dB vertical eye closure penalty".
OR
2) Add footnote "C" associated with Vertical eye closure penalty which states "Vertical eye closure penalty is a test condition for measuring Stressed receive sensitivity. It is not a required characteristic of the receiver".

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.4.2** *P* **38.10** *L* **48** # **62**

Dan Brown AMP

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

The channel insertion loss numbers for 1000BASE-LX have been calculated incorrectly. They are stated correctly in Table 38-11.

SuggestedRemedy

Replace current values for channel insertion loss given in Table 38-9 with following values " 2.32; 2.32; 2.32; 4.5". For each column, increase unallocated margin in link power budget accordingly.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.4.3** *P* **38.10** *L* **42** # **74**

Paul Kolesar Lucent Technologies

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

Wavelength of modal bandwidth not specified.

SuggestedRemedy

Change "modal bandwidth (minimum, overfilled launch)" to "Modal bandwidth @ 1300 nm (minimum, overfilled launch)".

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.4.3** *P* **38.10** *L* **47** # **75**

Paul Kolesar — Lucent Technologies

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

"Wavelength" row heading is unclear.

SuggestedRemedy

Change heading to "Wavelength of calculations below". Or delete row and ad "@ 830 nm" to the end of each of the three row headings below it.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.4.3** *P* **38.10** *L* **48** # **64**

Dan Brown — AMP

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

Nowhere in the document is the term "channel insertion loss" clearly and concisely defined.

SuggestedRemedy

Add footnote "b" associated with Channel insertion loss row of table 38-9 which states "Channel insertion loss consists of the combined connection insertion losses and cable attenuation for the optical channel as defined in clause 38.10. Operating distances used to calculate channel insertion loss are the maximum values specified in Table 38-6."

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.5** *P* **38.11** *L* **19** # **13**

Del Hanson — Hewlett-Packard Co.

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

During the editing process for D4.2, the total jitter column for TP3 was mistakenly listed as 480 ps rather than 408 ps. The TP3 total jitter of 0.510 UI parameter is correct; 0.510*800 ps = 408 ps.

SuggestedRemedy

On page 38.11, Line 19, change 480 to 408.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.6.1** *P* **38.11** *L* **44** # **48**

Joe Gwinn — Raytheon

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

The description of spectral width measurement is confusing, in that the section number "36A.5" is first (wrongly) read as the name of a Fibre Channel 10-bit symbol.

SuggestedRemedy

Change the sentence to read: "Spectral width shall be measured under modulated conditions using a section 36A.3 pattern ...", the word "section" having been added. If the IEEE Style Guide forbids calling a section a section, recast the sentence such that the 36A.3 cannot be interpreted as anything but a section.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.6.1** *P* **38.11** *L* **45** # **58**

Dan Brown — AMP

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

Center wavelength and spectral width measurements have gone from requiring a "random encoded 8B/10B pattern" to requiring the short continuous random test pattern specified in subclause 36A.5. This is inconsistent with the optical power measurements (subclause 38.6.2) which still allow "any valid encoded 8B/10B data stream".

Requiring the 36A.5 pattern for these measurements is overly restrictive since it limits the type of test equipment which can be used for this measurement. Laser spectral width and center wavelength are not known to be effected by using different 8B/10B codes at 1.25 GBd.

SuggestedRemedy

Suggest replacing lines 44 - 46 with following statement "Center wavelength and spectral width shall be measured under modulated conditions using any valid encoded 8B/10B data stream under full power conditions over the entire nominal operating temperature range."

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.6.11** *P* **38.14** *L* **51** # **77**

Dan Brown AMP

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

The title of subclause 38.6.11 and accompanying text need to be more direct about identifying exactly what is being measured with the test signal.

Terminology is not used in a consistent manner throughout this clause, leading to confusion for the reader.

SuggestedRemedy

In order to make subclause 38.6.11 more clear and concise, suggest the following changes:

Change title of subclause 38.6.11 to "Test signal at TP3 for receiver conformance testing."

Change the first sentence of clause 38.6.11 to read "Receivers conforming to the stressed receive sensitivity requirements of clause 38.6.7 and the total jitter requirements of clause 38.6.8 shall use a signal at TP3...".

Change second sentence to read "The conformance test signal shall be generated using the short continuous random test pattern defined in Clause 36A.5, and is conditioned..."

Change the title of Figure 38-5 to read "Apparatus for generating receiver conformance test signal at TP3".

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.6.12** *P* **38.16** *L* **21-51** # **81**

Dan Brown AMP

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

The test procedure for measuring receiver 3 dB electrical upper cutoff frequency is not developed sufficiently. Since this is an entirely new test which is not officially documented elsewhere, the procedure needs to be more formal in nature. In other words, it needs to look more like an FOTP with specific step by step instructions.

For example the current procedure instructs the reader to calibrate out the frequency response of the laser and modulator yet gives no clue how to do it. It tells the user to convert from optical to electrical dB but provides no equation to perform such a conversion. See suggested remedy below for specific recommendations.

SuggestedRemedy

Suggest replacing current text in section 38.6.12 with following in order to make the test procedure more formal:

"Measurement of the receiver 3 dB electrical upper cutoff frequency shall be performed using the test setup shown in Figure 38-6. This test involves measuring the receiver amplitude vs. frequency characteristics using a digital data signal with an analog RF signal added asynchronously to the data pattern. The data pattern used is the short continuous random test pattern defined in clause 36A.5. Due to the labor intensive nature of this test, computer instrument control and software automation is recommended to reduce the cycle time for each device tested. The upper 3 dB upper cutoff frequency is determined using the following steps a through f.

a) In order to obtain an accurate measurement, the frequency response characteristics of the test equipment including the RF signal generator, RF power combiner, and laser source must be calibrated out of the final measurement. In practice, this is done by substituting a high speed analog O/E converter for the DUT and a network analyzer for the BERT in Figure 38-6. The pattern generator is not required for this purpose.

Using the network analyzer to control the RF signal generator, sweep the RF signal over a range of frequencies corresponding to the expected 3 dB electrical upper cutoff frequency of the receiver to be tested (an added margin of several hundred Megahertz is recommended). At periodic frequency intervals, use the network analyzer to measure and record the optical power amplitude (dBm) vs. frequency of the test system.

b) Adjust the test equipment configuration as shown in Figure 38-6. Care should be taken to minimize any changes to the signal path which would effect the system frequency response after the calibration (step a) has been performed. Using the pattern generator, modulate the laser source with the specified data pattern. With no RF modulation applied, set the optical power to the stressed receive sensitivity level in Table 38-4 for 1000BASE-SX receivers and in Table 38-8 for 1000BASE-LX receivers. Ensure that the laser source extinction ratio is adjusted for worst case conditions (9 dB).

c) Using the BER tester, perform a clock-to-data alignment function in order to locate the center of the received eye. Apply RF modulation to the laser source while maintaining the same average optical power level established in step b.

d) Sweep the RF signal generator over the same range of frequencies used to calibrate the

test system in step a. At the same periodic frequency intervals used in step a, adjust the RF modulation amplitude to maintain a constant BER (e.g. 10E-6). At each frequency interval, measure and record the RF electrical power amplitude (in dBm) required to maintain a constant BER. [Editor's note: The test setup does not currently provide a way to measure RF electrical power amplitude. Need to change Figure 38-6 to include an RF power splitter and RF power meter.)

e) Correct the measured frequency response for the receiver under test by subtracting the test system's calibrated amplitude vs. frequency data measured in step a from the frequency response measured in step d. Since the calibration data was measured in optical power (dBm), it must first be converted to dBmelectrical using the following formula:

dBmelectrical = dBmoptical x 2

The result of step e will be a data set which may be used to plot the receiver electrical amplitude in dB vs. frequency in Hz.

f) The receiver 3 dB electrical upper cutoff frequency is that frequency where the corrected RF modulation amplitude increases by 3 dB (electrical)."

I realize that this proposal is not perfect however I believe it comes much closer to representing a formal test procedure than what we currently have. At the interim meeting it should be possible to fill in the few remaining blanks which would allow this revised procedure to be included in Clause 38.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.6.3** *P* **38.12** *L* **4** # **49**

Joe Gwinn Raytheon

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

The description of extinction ratio measurement is confusing, in that the section number "36A.5" is first (wrongly) read as the name of a repeated Fibre Channel 10-bit symbol used as a data pattern.

SuggestedRemedy

Change the sentence to read: "... the node transmitting the data pattern specified in 36A.3.".

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.6.3** *P* **38.12** *L* **4** # **12**

Del Hanson Hewlett-Packard Co.

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

During the editing process for D4.2, the test pattern to be used for extinction ratio measurements was mistakenly changed from "repeating K28.7" to "36A.3". It should have been changed to "36A.2". Maintaining the note on line 7 referencing K28.7 confirms that there was no intent to change the line code.

SuggestedRemedy

On page 38.12, Line 4, change 36A.3 to 36A.2.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.6.3** *P* **38.12** *L* **7** # **50**

Joe Gwinn Raytheon

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

The note about how repeated K28.7 generates a 125-MHz square wave appears to have been overcome by events, both because 36A.3 calls out a different pattern, K28.5, and because such notes probably are better kept in section 36A anyway.

SuggestedRemedy

Move the 125-MHz note to section 36A.2 (not 36A.3).

Add like notes where possible in section 36A, removing them from wherever they are scattered around in the main text. Section 36A.1 comes immediately to mind.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.6.3** *P* **38.12** *L* **7** # **3**

Brad Booth Jato Technologies

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

Note references K28.7, but K28.7 has been removed from proceeding paragraph.

SuggestedRemedy

Delete or update note.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.6.5** *P* **38.12** *L* **44** # **51**

Joe Gwinn Raytheon

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

This note giving the reference to ITU-T G.957 as the source for the fourth-order Bessel-Thompson filter puts us into a bit of a quandry, and does not solve the original problem that this reference was added to solve: Which is normative, the text of section 38.6.5, which levies an impossible requirement in that no actual filter can implement a mathematical ideal, or is it Annex 1 of ITU-T G.957? Strict reading of section 38.6.5 says that it's still the impossible mathematical ideal.

SuggestedRemedy

In line 31, remove the "shall". Reword section to make it informative, and also to make the referenced Annex 1 of ITU-T G.957 normative. Or, reword the entire section such that it levies an achievable requirement.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.6.9** *P* **38.14** *L* **38** # **59**

Dan Brown AMP

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

Deterministic jitter measurement continues to reference the use of a K28.5 character, yet other subclauses now reference the test patterns of Annex 36A.

SuggestedRemedy

Suggest adding the following statement after the first sentence: "The test shall utilize the mixed frequency test pattern specified in 36A.3."

Suggest replacing lines 37 - 38 with following statement "The method utilizes a digital sampling scope to measure actual vs predicted arrival of bit transitions of the 36A.3 data pattern."

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.8** *P* **38.8** *L* **11** # **61**

Dan Brown AMP

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

The channel insertion loss numbers for 1000BASE-SX have been calculated incorrectly. They are stated correctly in Table 38-11.

SuggestedRemedy

Replace current values for channel insertion loss given in Table 38-5 with following values " 2.33; 2.53; 3.25; 3.43". For each column, increase unallocated margin in link power budget accordingly.

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.8.2** *P* **38.18** *L* **5** # **26**

Steven E. Swanson Corning Inc.

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

Isn't there another step in the process for international recognition? I understood that IEEE standards, while intended for international standardization, are not initially considered International Standards until further processing.

SuggestedRemedy

Delete "International"

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.9** *P* **38.18** *L* **16** # **27**

Steven E. Swanson Corning Inc.

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

Since external mode conditioning is not required for SX, there is no need for labeling it.

SuggestedRemedy

Delete "c) Type of external mode conditioning required (if applicable)."

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.9** *P* **38.18** *L* **24** # **28**

Steven E. Swanson Corning Inc.

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

Since mode conditioning patchcords are required for LX, the labeling should note it.

SuggestedRemedy

Delete "...(if applicable)."

Proposed Response *Response Status* **O**

Cl **38** *SC* **38.9** *P* **38.18** *L* **7** # **20**

howard frazier cisco systems, inc.

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

This subclause describes PMD labeling requirements, not PHY labeling requirements.

SuggestedRemedy

Change title of subclause to read "PMD labeling requirements".

Proposed Response *Response Status* **O**

Cl **38** *SC* **Annex 38A** *P* **38.31** *L* **10** # **39**

Steven E. Swanson Corning Inc.

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

The Editor's notes are confusing; Is the Annex staying or not?

SuggestedRemedy

Default: Delete Annex 38A unless needed.

Proposed Response *Response Status* **O**

Cl **38** *SC* **Annex 38B** *P* **38.32 and 3** *L* **1-55** # **40**

Steven E. Swanson Corning Inc.

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

This Annex was useful at one point in the development of the proposed standard. However, given the current requirements for operation over the installed base of fiber with overfilled launch bandwidth specifications, Annex 38B is no longer necessary and in fact, could be confusing to the reader.

SuggestedRemedy

Delete Annex 38B.

Proposed Response *Response Status* **O**

Cl **39** *SC* **39.2.3** *P* **39.** *L* # **55**

howard frazier cisco systems

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

The text and table describing the Signal Detect function is unnecessarily complex, and subject to misinterpretation. The essential requirements are not obvious, and there is a certain amount of redundancy.

SuggestedRemedy

Replace all of 39.2.3 with the following:

39.2.3 PMD signal detect function

The PMD Signal Detect function shall report to the PMD service interface, using the message PMD_SIGNAL.indicate(SIGNAL_DETECT) which is signaled continuously. PMD_SIGNAL.indicate is intended to be an indicator of electrical signal presence.

The SIGNAL_DETECT parameter shall be set to FAIL under the conditions defined in Table 39-1. The SIGNAL_DETECT parameter shall be set to OK under the conditions defined in Table 39-1, provided that the electrical input is generated by an appropriate electrical transmitter which is transmitting 1000BASE-X code-groups as defined in this standard.

Under all other conditions, the value of the SIGNAL_DETECT parameter is unspecified. This standard imposes no response time requirements on the generation of the SIGNAL_DETECT parameter.

Table 39-1 SIGNAL_DETECT value definition

Receive Conditions	Value
Vinput,Receiver < (receiver sensitivity + worst case local system noise)	FAIL
(Receive Sensitivity + local system noise) < or = Vinput,Receiver < Minimum differential Sensitivity OR Vinput, receiver > Maximum differential input	unspecified
Minimum differential sensitivity < or = Vinput,Receiver < or = Maximum differential input	OK

As an unavoidable consequence of the requirements for the setting of the SIGNAL_DETECT parameter, implementations must provide adequate margin between the input optical power level at which the SIGNAL_DETECT parameter is set to OK, and the inherent noise level of the PMD due to cross talk, power supply noise, etc.

Various implementations of the Signal Detect function are permitted by this standard, including implementations which generate the SIGNAL_DETECT parameter values in response to the amplitude or average power of the 8B/10B modulation of the electrical signal.

Proposed Response *Response Status* **O**

Cl **39** *SC* **39.3.3** *P* **39.8** *L* **6** # **42**

Doug Day VLSI Technology

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

The note, "The jitter specifications for TP1 and TP4 in Table 39-5 match ... Table 38-10" is not true since 38-10 has been changed.

SuggestedRemedy

Remove the note on page 39.8, lines 6 and 7.

Proposed Response *Response Status* **O**

Cl **39** *SC* **39.3.3** *P* **39.8** *L* **6** # **19**

howard frazier cisco systems, inc.

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

As a result of the changes to the jitter budget in clause 38, the NOTE which appears below table 39-5 is no longer true, and it was never very useful in any case.

SuggestedRemedy

Delete the note which appears on line 6 of page 39.8

Proposed Response *Response Status* **O**