Cl **00** *SC* *P* *L* # 448

D'Ambrosia, John Force10 Networks

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

All equations throughout D2.0 need to be re-evaluated for consistency.

SuggestedRemedy

Update all equations to be self-consistent with other equations.

Response *Response Status* **U**

REJECT.

[Editor's note: Changed clause number from 99 to 00]

See Response to comment 447

Cl **00** *SC* *P* *L* # 447

D'Ambrosia, John Force10 Networks

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

Various figures throughtout the entire document related to channel parameters (insertion loss (min & max), ICR, ILD, Return loss (including DD,CC, DC, and CD) and return loss's (which have been labeled "reflection coefficients in Clause 85 in D2.0)) and associated with the Tx and Rx output return loss parameters all need to be re-evaluated for consistency

SuggestedRemedy

Update all figures to be self consistent with other figures.

In all graphs (insertion loss, return loss, and crosstalk) the magnitude of all the y-axis should be positive magnitude. See dambrosia_02_0509 on naming nomenclature of charts.

Response *Response Status* **U**

REJECT.

[Editor's note: Changed clause number from 99 to 00]

There was consensus in the task force that a consistent format be adopted across all of the clauses but this is dependent on decisions on the parameter naming and equation format.

Cl **00** *SC* **0** *P* *L* # 451

D'Ambrosia, John Force10 Networks

Comment Type **ER** *Comment Status* **R**

Naming Parameters of mixed mode 4 port S-parameters is inconsistent within IEEE P802.3ba. A standard naming nomenclature is needed.

List of places needing updated

Clause 85:
Table 85-6 (Line 23): Differential to common mode conversion SCD11
Fig 85-5 caption
Page 249, Line 3 - "fitted cable assembly insertion loss"
Figure 86-8-Mode conversion of mated HCB-MCB
Text in subclause 86.9 Recommended electrical channel (informative)
Figure 86-12-Recommend response of PPI channel with HCB
In Table83A-1, Differential Output S-parameters and Common Mode Output S-parameters
In Table 83A02, Differential Input S-parameters and Differential Common Mode Input Conversion S-parameters
83A.3.4.4 Reflected differential to common mode conversion and text in sub-clause
Figure 83A-9-Reflected differential to common mode conversion
Text in sub-clause 83A.4 Interconnect characteristics
Figure 83A-11-Channel insertion loss
Figure 83A-12-Channel Return Loss
TC6 and TC7 in 83A.7.4 XLAUI/CAUI Transmitter Requirements
RC2 and RC3 in 83A.7.5 XLAUI/CAUI Receiver Requirements
In Table 83B-2, Module input reflection SDD11 and Module output reflection (SDD22)
In Table 83B-4, Host output reflection SDD22 and Host input reflection SDD11
HC3 and HC4 in 83B.4.4 Host requirements

85.10.4 Cable assembly return loss & test in subclause
Fig 85-7 caption
85.9.1: Transmitter and receiver differential printed circuit board trace loss & text in sub-clause
85.9.2 Channel insertion loss & text in subclause
85.9.3 Channel return loss & text in subclause
Table 85-7 (Line 40) Maximum Insertion Loss
85.10.2 Cable assembly insertion loss and text in subclause

86.6.1.1 SDD11 at TP1 and SDD22 at TP1a and text in subclause
86.6.1.2 Common mode output reflection coefficient SCC22 at TP1a and TP4
In Table 86-6, Differential output reflection coefficient, SDD22 and Common mode output reflection coefficient, SCC22
In Table 86-7 Differential input reflection coefficient, SDD11 and Reflected differential to common mode conversion, SCD11
In Table 86-11 Differential output reflection coefficient, SDD22 and Common mode output reflection coefficient, SCC22
In Table 86-12,
Figure 86-3-Differential and common-mode reflection specifications
86.6.5.1 SDD22 at TP4 and SDD11 at TP4a & text in subclause
Figure 86-5-Through response of HCB and MCB excluding connector
Text in Sub-clause 86.7.1.1 Compliance board parameters
Figure 86-6-Through response of mated HCB-MCB

SuggestedRemedy

Rename all parameters using standard naming nomenclature
see presentation (dambrosia_02_0509)

Response *Response Status* **U**

REJECT.

There was consensus in the task force that a consistent naming convention be adopted across all of the clauses.

Cl **00** *SC* **0** *P* **126** *L* **18** # 577

Booth, Brad AMCC

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

In the architectural figures for 802.3ba, there is a reference in the stack to 40GBASE-R PCS and 100GBASE-R PCS. This is incorrectly described relative to the description in Clause 82 which defines it as a 64B/66B PCS. Being verify specific is not required. For example, the 802.3 specification references 8B/10B PCS, 64B/66B PCS or just PCS in many instances through the standard. Calling out the specific port type is note required.

SuggestedRemedy

Change all diagrams to show 40GBASE-PCS and 100GBASE-R PCS as 64B/66B PCS.

Response *Response Status* **U**

REJECT.

There is a single lane 64B/66B PCS for 10GBASE-R. Hence to differentiate that the 40G and 100G R PCS is not the same as a 10G R PCS this specific reference was added. Also, the 40GBASE-R PCS is different from the 100GBASE-R PCS in terms of the number of lanes etc.

Cl **01** *SC* **1.4** *P* **23** *L* **46** # 541

Booth, Brad AMCC

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

L stands for long wavelength.

SuggestedRemedy

Change to read:
40GBASE-LR4: IEEE 802.3 Physical Layer specification for 40 Gb/s using 40GBASE-R encoding over four WDM lanes on single-mode fiber using long wavelengths.

100GBASE-LR4: IEEE 802.3 Physical Layer specification for 100 Gb/s using 100GBASE-R encoding over four WDM lanes on single-mode fiber using long wavelengths.

Response *Response Status* **U**

REJECT.
Since the 100GBASE-LR4 and 100GBASE-ER4 PMDs use identical wavelengths, they cannot be distinguished by means of a letter indicating wavelength.
In the 40GBASE and 100GBASE nomenclature the L does not stand for long wavelength, it stands for long reach.
This nomenclature was adopted by the task force in May 2008 (See slide 8 of Ganga_02_0508 and Motion #2 in May 2008 minutes).

Cl **01** *SC* **1.4** *P* **23** *L* **49** # 542

Booth, Brad AMCC

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

S stands for short wavelength.

SuggestedRemedy

Change to read:
40GBASE-SR4: IEEE 802.3 Physical Layer specification for 40 Gb/s using 40GBASE-R encoding over four lanes of multimode fiber using short wavelengths.

100GBASE-SR10: IEEE 802.3 Physical Layer specification for 100 Gb/s using 100GBASE-R encoding over ten lanes of multimode fiber using short wavelengths.

Response *Response Status* **U**

REJECT.
In the 40GBASE and 100GBASE nomenclature the S does not stand for short wavelength, it stands for short reach.
This nomenclature was adopted by the task force in May 2008 (See slide 8 of Ganga_02_0508 and Motion #2 in May 2008 minutes).

Cl **01** *SC* **1.4** *P* **24** *L* **10** # 545

Booth, Brad AMCC

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

E stands for extra long wavelength.

SuggestedRemedy

Change to read:
IEEE 802.3 Physical Layer specification for 100 Gb/s using 100GBASE-R encoding over four WDM lanes on single-mode fiber using extra long wavelengths.

Response *Response Status* **U**

REJECT.
Since the 100GBASE-LR4 and 100GBASE-ER4 PMDs use identical wavelengths, they cannot be distinguished by means of a letter indicating wavelength.
In the 40GBASE and 100GBASE nomenclature the E does not stand for extra long wavelength, it stands for extended reach.
This nomenclature was adopted by the task force in May 2008 (See slide 8 of Ganga_02_0508 and Motion #2 in May 2008 minutes).

Cl **30** *SC* **30.5.1.1.2** *P* **30** *L* **18** # 550

Booth, Brad AMCC

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

E is for extra long wavelength.

SuggestedRemedy

Change "with extended reach" to "extra long wavelength" for 100GBASE-ER4.

Response *Response Status* **U**

REJECT.

See #545

Cl **30** *SC* **30.5.1.1.2** *P* **30** *L* **9** # 549

Booth, Brad AMCC

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

L refers to long wavelength.

SuggestedRemedy

Change:
with long reach
To read:
using long wavelength
For 40GBASE-LR4 and 100GBASE-LR4.

Response *Response Status* **U**

REJECT.

See #541

Cl **69** *SC* **69.1.3** *P* **94** *L* **14** # 560

Booth, Brad AMCC

Comment Type **TR** *Comment Status* **A**

Figure 69-1 shows the 40G PCS as 40GBASE-R PCS. This is an incorrect reference that doesn't follow with the PCS descriptions for the other PHYs. An 8B/10B PCS is used for 1000BASE-KX, and it is also used for 10GBASE-KX4 even though they are different.

SuggestedRemedy

Change 40GBASE-R PCS to be 64B/66B PCS.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.
The 8B/10B encoding used in 1000BASE-KX is not the same as that used in 10GBASE-KX4 so the current diagram is misleading.

In Figure 69-1 change
"8B/10B PCS" in the 1000BASE-KX stack to "1000BASE-X PCS"
"8B/10B PCS" in the 10GBASE-KX4 stack to "10GBASE-X PCS"
"64B/66B PCS" in the 10GBASE-KR stack to "10GBASE-R PCS"

Cl **69** *SC* **69.3** *P* **96** *L* **3** # 632

Ganga, Ilango Intel

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

"Add" is not a valid editing instruction as per 2009 IEEE standards style manual. Change "Add" to "Insert" in Clause 69 and elsewhere in the draft

SuggestedRemedy

Replace editing instructions from "Add" to "Insert"

Use the following editing instructions only throughout the draft 802.3ba. Check 802.3ba and make changes as necessary when there is a deviation from the 2009 style manual.

Editing instructions: Change, Insert, Delete and Replace

Response *Response Status* **U**

ACCEPT.

Cl **73** *SC* **73.10.1** *P* **102** *L* **8** # 565

Booth, Brad AMCC

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

Addition of 10GBASE-CX4 is outside the scope of the project.

SuggestedRemedy

Delete text related to 10GBASE-CX4.

Response *Response Status* **U**

REJECT.

Clause 73 autonegotiation has been extended to include 40GBASE-CR4 and other 802.3ba PHYs.

10GKX4 in the base 802.3-2008 standard is used to indicate the parallel detection of 10GBASE-KX4 by the Clause 48 PCS.

The Clause 48 PCS is also used by 10GBASE-CX4.

There is the possibility of an end point using 40GBASE-CR4 connecting to a legacy 10GBASE-CX4 end-point. (40GBASE-CR4 and 10GBASE-CX4 share a common connector.) If this were to happen the 10GKX4 indication would be set by the Clause 48 PCS if present.

For this reason the description of 10GKX4 has been modified to include either KX4 or CX4 parallel detection.

Vote in BRC
yes to comment response 8
no to comment response 2

see also comment 563

Cl **73** *SC* **9.1** *P* **101** *L* **28** # 416

Ghiasi, Ali Broadcom

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

In the 40/100GbE applications it is feasible that the PCS and the PHY are not located in the same chip and there may be PCB signal for speed detection.

SuggestedRemedy

Add text: Auto-Negotiation primitive may pass between the PCS and XLAUI/CAUI retimer as out of band PCB signal traces .

Response *Response Status* **U**

REJECT.
As with many other primitives, the physical instantiation of this primitive is not defined

Cl **80** *SC* **80.1.3** *P* **126** *L* **17** # 575
Booth, Brad AMCC

Comment Type **ER** *Comment Status* **R**

In Figure 80-1, the PCS are described as a 40GBASE-R PCS and a 100GBASE-R PCS. This does not follow the convention previously established.

SuggestedRemedy

Change 40GBASE-R PCS and 10GBASE-R PCS to be 64B/66B PCS.

Response *Response Status* **U**

REJECT.

See response to comment #577

Cl **80** *SC* **80.3** *P* **131** *L* **5** # 528
Frazier, Howard Broadcom

Comment Type **TR** *Comment Status* **A**

In table 80-2, the delay constraint for the 40G MAC, RS and MAC Control is needlessly tight. At 10G, the delay constraint was 16 pause quanta, or 8192 BT. For 40G, draft D2 allows only 10 pause quanta, or 5120 BT. It is hard to see how a 40G implementation is going to be able to react in a shorter number of pause quanta than a 10G implementation, given that data path widths and state machine clock frequencies are not likely to scale exactly linearly, and certainly won't scale super-linearly.

It would make better sense to allow a longer reaction time at 40G, relative to 10G.

SuggestedRemedy

Increase the delay constraint on the 40G MAC, RS and MAC Control to 32 pause quanta, or 16384 BT, to allow for a broader range of implementations.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

Change the 40 Gb/s MAC, RS, and MAC Control delay to 20 pause_quanta and the 100 Gb/s MAC, RS, and MAC Control delay to 48 pause_quanta.

See response to comment #275

Cl **81** *SC* **81.1.4** *P* **138** *L* **52** # 529
Frazier, Howard Broadcom

Comment Type **TR** *Comment Status* **A**

In table 81-1, the delay constraint for the 40G MAC, RS and MAC Control is needlessly tight. At 10G, the delay constraint was 16 pause quanta, or 8192 BT. For 40G, draft D2 allows only 10 pause quanta, or 5120 BT. It is hard to see how a 40G implementation is going to be able to react in a shorter number of pause quanta than a 10G implementation, given that data path widths and state machine clock frequencies are not likely to scale exactly linearly, and certainly won't scale super-linearly.

It would make better sense to allow a longer reaction time at 40G, relative to 10G.

SuggestedRemedy

Increase the delay constraint on the 40G MAC, RS and MAC Control to 32 pause quanta, or 16384 BT, to allow for a broader range of implementations.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.
Change the 40 Gb/s MAC, RS, and MAC Control delay to 20 pause_quanta and the 100 Gb/s MAC, RS, and MAC Control delay to 48 pause_quanta.
See Response to comment 275.

Cl **83** *SC* **83.5.10** *P* **208** *L* **4** # 57

Dawe, Piers Avago Technologies

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

The PMA receive side PRBS31 checker would be much more useful if it could check a signal that had been through a gearbox, e.g. when testing whole modules or whole gearbox ICs. This is more of a concern for 100G than for 40G. The remedy below makes checking at the PCS lane level optional, for the sake of existing IC designs.
If wished, can have an extra ability bit in Clause 45 to tell management that the better way of checking is implemented.

SuggestedRemedy

Change the paragraph to:
When check Rx PRBS31 test pattern mode is enabled by bits 1.19.7 and 1.19.0 (see 45.2.1.12b), the PMA expects to find one or (optionally) two interleaved PRBS31 pattern(s) on each of the lanes received from the PMA server via the PMAserver_UNITDATA.indicationx primitive. Where there are 10 PMA lanes and no errors, there are always two bit-interleaved PRBS31 patterns, one per PCS lane. In many situations, each PMA lane can also be seen as carrying a single PRBS31. The Rx test pattern error counters in registers 1.30 through 1.39 (see 45.2.1.12d) count, per PMA lane, errors in detecting the PRBS31 patterns on the lanes from the PMA server. If the 20 bit-interleaved PRBS31 patterns are checked, the errors are summed for each PMA lane. While in check... [last two sentences unchanged]

Response *Response Status* **U**

REJECT.

The properties of bit-muxed PRBS31 need to be analyzed before accepting this proposal.

Cl **83A** *SC* **5.2** *P* **384** *L* **12** # 413

Ghiasi, Ali Broadcom

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

Limiter function gain must be defined

SuggestedRemedy

Propsoe min gain of 20 dB

Response *Response Status* **U**

REJECT.
Add the following to 83A.5.2:

."followed by a limiting function with minimum gain of 20dB..

Cl **83A** *SC* **83A.2.1** *P* **372** *L* **46** # 481

D'Ambrosia, John Force10 Networks

Comment Type **TR** *Comment Status* **A**

Any interconnect which has a loss less than SDD21(dB) = ?]0.0006?]0.16?ã(f)?]0.0587(f) where f is from 0.25 GHz to 11.1 GHz, between the XLAUI/CAUI transmit pin and Transmit Compliance Point may be used as long as transmitter parameters of Table 83A-1 are met.

Given that the compliance point will form the basis of normative measurements, it should also be normative. Text is also confusing.

SuggestedRemedy

1. Rewrite sentence

The differential insertion loss, CPIL, expressed in decibels, between the transmit pin and the transmit compliance point shall be less than CPILmax, as defined by Equation 83C-x:

CPIL(f) <= CPILmax(f) = 0.0006 +(0.16*(f)^(1/2)) + (0.0587*(f)) (83A-x)
where F is in Ghz
for 10 MHz <= f < 11.1 GHz

The differential insertion loss limit is illustrated in Fig 83A-x.

Add figure showing illustration of differential insertion loss limit and appropriate pics statement.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

The differential insertion loss, CPIL, expressed in decibels, between the transmit pin and the transmit compliance point shall be less than CPILmax, as defined by Equation 83A-x, which is illustrated in Fig 83A-x.

SDD21=0.00086 - 0.2286*sqrt(f) - 0.08386*f, where f is in GHz from 0.25 to 11.1 GHz

Add figure showing illustration of differential insertion loss limit and add appropriate pics statement.

Cl **83A** *SC* **83A.2.2** *P* **373** *L* **3** # 482

D'Ambrosia, John Force10 Networks

Comment Type **TR** *Comment Status* **A**

Any interconnect which has a loss less than SDD21(dB) = ?]0.0006?]0.16?ã(f)?]0.0587(f) where f is from 0.25 GHz to 11.1 GHz, between the XLAUI/CAUI receive pin and Receive Compliance Point may be used as long as receiver parameters of Table 83A-2 are met.

Given that the compliance point will form the basis of normative measurements, it should also be normative. Text is also confusing.

SuggestedRemedy

1. Rewrite sentence

The differential insertion loss, CPIL, expressed in decibels, between the receive pin and the receive compliance point shall be less than CPILmax, as defined by Equation 83C-x, which is illustrated in Fig 83A-x.

Refer to previously Added figure (for tx compliance point) showing illustration of differential insertion loss limit and add appropriate pics statement.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

The differential insertion loss, CPIL, expressed in decibels, between the receive pin and the receive compliance point shall be less than CPILmax, as defined by Equation 83A-x, which is illustrated in Fig 83A-x.

SDD21=0.00086 - 0.2286*sqrt(f) - 0.08386*f, where f is the frequency in GHz from 0.25 to 11.1 GHz

Add figure showing illustration of differential insertion loss limit and add appropriate pics statement.

Cl **83A** *SC* **83A.3.3.3** *P* **375** *L* **37** # 639

Ganga, Ilango Intel

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

The equations in Annex 83A are not consistent with the format for equations used in the rest of the document. (E.g Equations 83A-4, 83A-5, 83A-7, 83A-8 etc.,).

In general equations used in the draft are not consistent across the clauses.

This comment also applies to Clauses 84 through Clause 88 and corresponding annexes.

SuggestedRemedy

Reformat the equations to be consistent across all clauses and annexes.

Response *Response Status* **U**

ACCEPT.

Cl **83A** *SC* **83A.3.4.7** *P* **379** *L* **49** # 59

Dawe, Piers Avago Technologies

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

It's not clear that these jitter specs allow the two concatenated CDRs and an optical link, XFP style, that will be wanted when connecting e.g. a 40GBASE-LR4 module. This is a jitter accumulation issue, and has almost nothing to do with the optical specifications (it would apply to a CR4 link using a big module and clocks derived from the signal also).

SuggestedRemedy

Modify the jitter specifications to be sure they do allow two concatenated CDRs and an optical link, XFP style. This may mean that the specs on the transmit side and receive side differ - I think there has to be a single-tone sinusoidal jitter mask for the transmit side nAUI link, like Fig. 83A-10 but with reduced SJ and corner frequency as appropriate for a transmitter. Fig. 83A-10 can remain for the receive side nAUI link.
If we don't know the answers in the meeting, put in an editors note and develop the solution in time for the July meeting.

Response *Response Status* **U**

REJECT.

The scope of the jitter specification is not to address the 2 concatenated CDRs and an optical link XFP style. Additional information required to support the need for specification changes.

Optical link requirements are defined in other sections.

Cl **83A** *SC* **83A.5.2** *P* **383** *L* **52** # 611

Petrilla, John Avago Technologies

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

The phrase "at least" in the instruction in the first sentence, "... comprised of at least 0.42 UIpp deterministic jitter, and 0.2 UIpp random jitter" can lead to problematic results. This allows significant overstress, e.g. DJ of 1.0 UIpp would meet the requirement.

SuggestedRemedy

Change, the first sentence from , "... comprised of at least 0.42 UIpp deterministic jitter, and 0.2 UIpp random jitter" to "... comprised of 0.42 UIpp deterministic jitter, and 0.2 UIpp random jitter"

Response *Response Status* **U**

REJECT.

This is a minimum value specified

Cl **83B** *SC* **83B.2.2** *P* **391** *L* **41** # 449

D'Ambrosia, John Force10 Networks

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

Clause 83B has no crosstalk requirements on host compliance. Furthermore, Clause 83A has minimal guidance regarding channel crosstalk constraints

Note: 2.5 dB receive eye margin is allocated to account for crosstalk and reflection penalties.

SuggestedRemedy

Apply the following crosstalk limits to Host Compliance.
Propose to limit total NEXT to power sum of 2 aggressors per Eq 86-12. Add appropriate equation.

Propose to limit total FEXT to power sum of 2 aggressors per Eq 86-13. Add appropriate equation.

Add these crosstalk limits to XLAUI / CAUI in Annex 83A

Response *Response Status* **U**

REJECT.

Crosstalk is included in nAUI transmit jitter and receiver tolerance measurements by having all channels active.

Cl **85** *SC* **85.1** *P* **231** *L* **33** # 76

Dawe, Piers Avago Technologies

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

Because CRn relies on equalisation even more than KR, and because it is not only aimed at closed systems where the owner of all parts can decide what MTTFPA he can tolerate, we must assure an acceptable MTTFPA in all circumstances. To do that we need to know more about the error propagation statistics of CRn.

SuggestedRemedy

Find out what the error propagation statistics of CRn are, then work out the MTTFPA. If it isn't adequate, fix the issue (there may be several ways to fix it).

Response *Response Status* **U**

REJECT.
One of the obectives for CR4 and CR10 is to use the KR electricals and the KR channel parameters as an upperbound. Please see gustlin_04_0509 CR4/CR10 MTTFPA relative to the age of the universe (slide 7).

Cl **85** *SC* **85.10** *P* **247** *L* **30** # 75

Dawe, Piers Avago Technologies

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

I don't believe that these specifications provide adequate protection for the receiver, because there is no control over the cable's phase response (this is much worse in CRn than KR because the channel is much longer).

SuggestedRemedy

Add a phase response or impulse response spec.

Response *Response Status* **U**

REJECT. The commenter has not provided a sufficiently complete proposal that would enable the implementation of suggested remedies. It's anticipated that the outcome of the interferance tolerance test parameterization will yield a sufficiently characterized channel response.

Cl **85** *SC* **85.10.2** *P* **248** *L* **13** # 72

Dawe, Piers Avago Technologies

Comment Type **TR** *Comment Status* **A**

Specification range for cable insertion loss is not adequate especially at low frequencies.
SFP+ Annex E cable S-parameter specs go down to 10 MHz. This is not about 1G operation; a cable that is allowed any amount of loss below 100 MHz WILL be expected to fail at 10G/lane, 64B/66B.
10GBASE-KR specs (72 and 69B) go down to 50 MHz.
If "it's just a wire" then meeting a spec below 50 MHz will be easy. Remember this is not a measurement standard; no-one has to measure something if they can convince the customer that "it's just a wire" so there isn't a cost or test-time problem.
However, For Style-1 40GBASE-CR4 and 100GBASE-CR10 plug connectors the receive lanes are AC-coupled; the coupling capacitors are contained within the plug connectors.

SuggestedRemedy

Extend the frequency range of Cable assembly insertion loss, Cable assembly return loss, Near-End Crosstalk, MDNEXT, FEXT and MDELFEXT down to 10 MHz at the low end.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.
see comment#453 for remedy to min frequency
NOTE-It is recommended that the value of the coupling capacitors be 100 nF. This will limit the
in rush currents and baseline wander.

Cl **85** *SC* **85.7.4** *P* **239** *L* **16** # 71

Dawe, Piers Avago Technologies

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

Exchange of DME frames is an unnecessary burden on the host. It is not necessary for these copper links, and should not appear on front-panel ports. The choice of link types is 4 x 3.125 lanes, 4x10G lanes, and 4x10G lanes with FEC, and this can be managed with 'Parallel Detection' not DME frames.
In the future, and in closed systems such as a supercomputer, support for legacy CX4 will be unnecessary.

SuggestedRemedy

Add text in Clause 85 saying that 40GBASE-CR4 and 100GBASE-CR10 can use Parallel Detection.
Add text in Clause 85 saying that 40GBASE-CR4 and 100GBASE-CR10 may optionally recognise CX4, but not necessarily.

Response *Response Status* **U**

REJECT.
Suggested remedy inconsistent with baseline objetive to utilize 802.3ap electricals and to include backward compatability with CX4 see diminico_02_0708.pdf.

The commenter has not provided a sufficiently complete proposal for replacement of DME frames with a parallel detection mechanism.

Cl **85** *SC* **85.8.3** *P* **241** *L* **35** # 80

Dawe, Piers Avago Technologies

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

Need normative reflection specs at TP2 and TP3.

SuggestedRemedy

Would the PPI limits be suitable?

Response *Response Status* **U**

REJECT. The commenter has not provided a sufficiently complete proposal that would enable the implementation of suggested remedies; analysis required to determine suitablity of PPI.

Cl **85** *SC* **85.8.4.1** *P* **244** *L* **30** # 79

Dawe, Piers Avago Technologies

Comment Type **TR** *Comment Status* **A**

As Ali and others have observed, there is no meaningful receiver spec for assessing a piece of equipment against. There needs to be a solid spec and compliance test at TP4 (possibly TP3 if you can work out how). What we have here:
"The receiver shall operate with a BER 10-12 or better when receiving a compliant transmit signal, as defined in 85.8.3, through a compliant cable assembly as defined in 85.10 exhibiting the maximum insertion loss of
85.10.2."
Is weak and vague. It needs to be a defined worst-case signal, through a defined worst-case test channel with defined loss AND CROSSTALK and REFLECTION characteristics. Optical links have had stressed sensitivity specs for 10 years now, SFP+ has something. No reason why this PMD should have lower standards.

SuggestedRemedy

Add formal stressed sensitivity or tolerance test, with defined signal, defined test channel with defined loss, crosstalk and reflection characteristics. You may need two test cases: low loss and high loss.

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

See comment#700 for resolution

Cl **85** *SC* **85.9** *P* **247** *L* **4** # 638

Ganga, Ilango Intel

Comment Type **ER** *Comment Status* **R**

Scale for Graphs in Clause 85 are not consistent with the graphs in other clauses. E.g Fig 85-4 to Fig 85-8

SuggestedRemedy

Re-plot the graphs Fig 85-4 to Fig 85-8 to be consistent with the format and scale used in other clauses across the draft.

Response *Response Status* **U**

REJECT.
Editor implemented baseline objective for consistency with 10GBASE-CX4 cable assembly specifications i.e., other IEEE 802.3 specifications for twinaxial cable. See Figure 54-7- Maximum cable assembly insertion loss (informative)

Cl **86** *SC* **86.6.1** *P* **275** *L* **24** # 467

D'Ambrosia, John Force10 Networks

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

The first line states that "Each lane of the electrical transmit signal for a 40GBASE-SR4 or 100GBASE-SR10 transmitter, if measured at TP1a (see 86.7.1), shall meet the specifications of Table 86-6 per the definitions in 86.7."

86.6.1.1 addresses Differential Return Loss. It does not state that it is illustrated in Fig. 86-3
86.6.1.2 addresses Common Mode Return Loss, and it is stated that the limit is shown in Fig 86-3.

Fig. 86-3 also shows Differential to Common Mode Return Loss. There is no corresponding section or equation. The specification for SCD11 is in Table 86-7.

The PICS do not call out an item for SCD11.

SuggestedRemedy

Add the following text for a new subclause

86.6.1.3 Differential to Common Mode Return Loss
The transmitter Differential to Common-Mode Return loss RLCD, measured in dB at TP1, shall be greater than or equal to RLCDmin, as defined by Equation (86.x):

RLCD(f) >= RLCDmin(f) = 10 (86-x)

for 10 MHz <= f < 11.1 GHz

The return loss limit is illustrated in Fig 86-x.

Add appropriate pics statement.

Response *Response Status* **U**

REJECT. The SCD11 limit is fully defined in Table 86-7, which has its PICS. There's no need for an equation. 86.6.1.1 states that the limit for SDD11 or SDD22 is illustrated in Fig. 86-3 (p276 line 53).

Cl **86** *SC* **86.6.1** *P* **276** *L* **17** # 460

D'Ambrosia, John Force10 Networks

Comment Type **ER** *Comment Status* **R**

Table 86-6 and 86-7 include the parameter DDPWS, but there is no description of it at this point in the clause, and no pointer to the explanation in 86.7.4.4.

SuggestedRemedy

Add a pointer to 86.7.4.4 in the "Conditions" column

Response *Response Status* **U**

REJECT.
Pointers in the table should not be added to some parameters and not others.
There is a general pointer on the previous page "specifications of Table 86-6 per the definitions in 86.7".
Also see response to comment 508.

Cl **86** *SC* **86.6.1.1** *P* **275** *L* **51** # 468

D'Ambrosia, John Force10 Networks

Comment Type **ER** *Comment Status* **R**

The limit defining SDDii is defined by two equations, but only a single equation # has been assigned.

This also applies to the limits currently defined by:
Equation 86-2
Equation 86-3
Equation 86-7
Equation 86-8
Equation 86-9
Equation 86-10
Equation 86-11
Equation 86-12
Equation 86-13
Equation 86-20
Equation 86-21

SuggestedRemedy

Assign an equation # to each equation that makes up a specified limit.

Response *Response Status* **U**

REJECT.
The format of the equations in clause 86 follows that used in clause 47 in that there is only a single left hand side as:

20×log10(|SDDii|) = -12 +2×V(f)
= -6.3 +13×log10(f/5.5)
This means that there is only one equation present and therefore only one equation number is required. This also makes references to the equations easier.

Cl **86** *SC* **86.6.1.1** *P* **277** *L* **1** # 459

D'Ambrosia, John Force10 Networks

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

The title for Fig 85-3 is Differential and common-mode reflection specifications. THe naming of the figure has to be corrected (noted in other comment), but the graph shows 3 types of return losses: Differential In, Differential Out, common-mode, and Differential to Common-mode.

SuggestedRemedy

Change caption of figure to just "Return Loss Specifications"

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.
Change caption of figure to "Reflection specifications"

Cl **86** *SC* **86.7.1.1** *P* **283** *L* **35** # 463

D'Ambrosia, John Force10 Networks

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

title of Fig 86-5 is confusing and uses wrong parameter

SuggestedRemedy

change caption to "PCB Differential Insertion Loss"

Response *Response Status* **U**

ACCEPT IN PRINCIPLE. The parameter is correct; S-parameters are how compliance boards are defined. See FC-PI-4 and SFF-8431. InfiniBand also uses S-parameters.
Change title to:
Figure 86-5-Through response (SDD21) of HCB and MCB excluding connector
Change title of next figure to:
Figure 86-6-Through response (SDD21) of mated HCB-MCB

Cl **86** *SC* **86.7.1.1** *P* **284** *L* **40** # 464

D'Ambrosia, John Force10 Networks

Comment Type **TR** *Comment Status* **A**

The specified return losses by equations 86-8 and 86-9 and illustrated in Fig 86-7 are practically on top of each other in the 0 to 11.1 GHz range. The explanation of these two equations as they relate to HCB and MCB are totally unclear, as to which equation applies to which board.

SuggestedRemedy

Use the worst case equation of the two return loss curves. Assuming that the illustration is correct, then only use equation for curve labeled "SDDii looking into HCB"b

Response *Response Status* **U**

ACCEPT IN PRINCIPLE.

In Figure 86-7 replace "SDDii looking into MCB" with "SDDmm looking into MCB"
Also replace "SDDii looking into HCB" with "SDDhh looking into HCB"

The feasibility of using a single equation for both limits requires further experimental results.

Cl **86** *SC* **86.7.5.4** *P* **291** *L* **36** # 276

Kolesar, Paul CommScope

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

The TDP test fails to assess the true chromatic dispersion impairment of the 40G/100GBASE-SR4/10 PMDs. Instead it places a surrogate filter into the test fixture receiver that is set to insert a reduction in channel bandwidth based on assumptions about the optical spectral behavior of the transmitter that are not true. Specifically, the filter-based methodology wrongly assumes the spectrum is constant as a function of time and the spectral shape is smooth and continuous. In fact the spectrum of multi-transverse mode lasers is strongly affected by modulation, typically changing in wavelength throughout a bit period, and their spectrum consists of a few discrete wavelengths with irregular adjacent amplitudes. These features affect the actual dispersion and cannot be accurately represented by a static filter. The problems associated with a filter-based approach are avoided when testing TDP of singlemode PMDs because an actual singlemode test fiber is used in the fixture that inserts the worst-case dispersion of the maximum length channel. This approach captures the effects of modulation and the wavelength variation called "chirp" of SM lasers, providing a much more accurate assessment of the transmitter performance and transmitter/fiber interaction. The availability of multimode fibers with bandwidths exceeding 10,000 MHz*km now permits the benefits of using a test fiber instead of a filter to be applied to the TDP test for multimode PMDs. In addition to greater accuracy, this approach adds the dimension of dispersion, presently frozen at a single value, to the compliance space. This added dimension enables maximal trade-off of jitter, distortion and dispersion which can positively impact production yield. More details are provided in kolesar_01_0509.pdf.

SuggestedRemedy

See complete proposal in kolesar_02_0509.pdf. Synopsis: a) insert into the TDP test bench a 50 µm fiber with modal bandwidth >= 10,000 MHz*km of a length chosen to apply the worst-case chromatic dispersion; b) adjust the receiver filter to remove the component associated with the present static surrogate for dispersion.

Response *Response Status* **U**

REJECT.

The sub task force voted on whether to implement the changes in kolesar_02_0509.pdf

Yes 12
No 5

Another comment points out that the surrogate filter causes problems and can be dispensed with anyway.
The proposed technique is interesting at a university level but unfamiliar, unproven and prone to unstable results with VCSELs.

This PMD is supposed to be cost-effective for the objective distance, where chromatic dispersion is not dominant. A new and unfamiliar test element would add cost and be misleading because the chromatic dispersion effects vary over time. It would be far too expensive and time-consuming to do this measurement with a useful level of confidence. Therefore any yield benefit would not flow to cost as hoped.

Cl **86** *SC* **86.7.5.4** *P* **291** *L* **45** # 277

Kolesar, Paul CommScope

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

The use of a fiber-based channel in the TDP test fixture proposed in another comment permits the fixture to easily adapt to screen transmitters with performance that supports distances exceeding the minimum requirements of clause 86. Such transmitters address the need for a cost-effective solution for channels exceeding 100 m (see kolesar_01_0908). The adjustment to the TDP test fixture should be described within the standard to ensure interoperability, for example in an informative annex. See kolesar_01_0509.pdf for supporting information and details.

SuggestedRemedy

Create informative annex 86A entitled "Transmitter and dispersion penalty (TDP) test for extended-reach capability". If the TDP test fixture adjustment to clause 86.7.5.4 proposed in another comment is accepted, the proposed content for the annex is found in kolesar_03_0509.pdf. If the TDP test fixture adjustment is not accepted, the proposed content for the annex is found in kolesar_04_0509.pdf.

Response *Response Status* **U**

REJECT. [Editor's note: the supporting material that was to be in kolesar_01_0509 is now in kolesar_05_0509]

A straw poll of the sub-task force was taken.
Do you support the creation of an informative annex similar to that proposed in kolesar_04_0509.pdf?

Yes 10
No 9
Abstain 7

Based on this result, the a vote of the sub-task force was taken on the following Response:
ACCEPT IN PRINCIPLE
Create an informative annex similar to that proposed in kolesar_04_0509.pdf with editorial license

Yes 12
No 12
Abstain 6

Cl **86** *SC* **86.7.5.4** *P* **291** *L* **48** # 353

Dudek, Mike Independent

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

It would be good to include the chromatic dispersion effects of the transmitter in the TDP measurement as is done for the single mode systems in clauses 87 and 88.

SuggestedRemedy

Introduce a wide band fiber into the measurement as described in Kolesar_02_0509.

Response *Response Status* **U**

REJECT.

See response to comment 276