

Cl 00 SC 0 P1 L30 # 9
Dawe, Piers IPtronics

Comment Type TR Comment Status D

An objective is "Provide Physical Layer specification which support 40 Gb/s operation over at least 2 km on SMF" and from the PAR, "5.4 Purpose: This project will define a 40 Gb/s serial PMD that supports a link distance of at least 2km over single-mode fiber ... which will enable interconnection ...". What we have so far is a very impressive start but has holes a few dB large which means it doesn't yet provide an interoperability spec. The transmitter can pass the draft and be poor, and the receiver can pass the draft and fail to receive that transmitter after the fibre. Some changes are needed to come up to 802.3's traditional standards for an interoperability spec.

SuggestedRemedy

See other comments for remedies.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Since no changes are proposed by this comment, make no changes to the draft due to it. See responses to related comments.

Cl 01 SC 1.4 P15 L41 # 10
Dawe, Piers IPtronics

Comment Type T Comment Status D

Up until now, F has meant for multimode fibre. If we use F for single-mode we will have to work to minimise confusion.

SuggestedRemedy

In 1.4.3 10BASE-F, 1.4.6 10BASE-FL segment and 1.4.7 10BASE-FP, insert "multimode" before "fiber".

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

The definitions for 10BASE-FL segment:

"A fiber optic link segment providing point-to-point connection between two 10BASE-FL Medium Attachment Units (MAUs)."

and 10BASE-FP segment:

"A fiber optic mixing segment, including one 10BASE-FP Star and all of the attached fiber pairs."

discuss link segments within 10BASE-F so it is sufficient to only modify the definition for 10BASE-F.

In 1.4.3 change:

"over fiber optic cable" to "over multimode fiber optic cable"

Cl 80 SC 80.1.5 P25 L24 # 11
Dawe, Piers IPtronics

Comment Type T Comment Status D

Table 80-2 shows optional XLPP1 for 40GBASE-FR. But the rest of the draft does not support this.

SuggestedRemedy

Make consistent, e.g. by removing the "O" here.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

In Table 80-2 remove the "O" for XLPP1 from the inserted 40GBASE-FR row.

Cl 80 SC 80.4 P27 L11 # 5
Firoozmand, Farzin Semtech

Comment Type TR Comment Status D

Table 80-3. The suggested max delay constrain for FR is copied from LR4. The FR implementation has an electrical (4:1) mux/demux while LR4 has an optical (4:1) mux/demux therefore 40G BaseFR includes a Serdes that is not in 40G Base LR4. Although not included in this standard, the Serdes has to include Deskew logic to support legacy tri-mode operation (this was one of the key requirements for 40G BaseFR). The 25.6ns max delay dictates the use of an un-necessary very high speed design circuitry (and process) which results in excessive power and potential higher cost.

SuggestedRemedy

Increase the max allowable delay constrain from 25.6 ns to 200ns to give flexibility to implementers in optimizing for power and cost based on different requirements

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Change the additional row in Table 80-3 from:

40GBASE-FR PMD, 1024, 2, 25.6

to

40GBASE-FR PMD, 8192, 16, 204.8

Also, in 89.3.1 change:

"The sum of the transmit and the receive delays at one end of the link contributed by the 40GBASE-FR PMD including 2 m of fiber in one direction shall be no more than 1024 bit times (2 pause_quanta or 25.6 ns)."

to

"The sum of the transmit and the receive delays at one end of the link contributed by the 40GBASE-FR PMD including 2 m of fiber in one direction shall be no more than 8192 bit times (16 pause_quanta or 204.8 ns)."

Cl 80 SC 80.4 P27 L11 # 6
SHANG, SONG SEMTECH CORP

Comment Type T Comment Status D

This spec is a direct copy from 40GBASE-LR4. 40GBASE-FR includes a Serdes (for electrical mux'ing) while 40GBASE-LR4 does not (it does optical mux'ing), 40GBASE-LR4 delay budget does not apply to 40GBASE-FR directly. as such the delay budget for FR should be larger. The Serdes in FR is more complex than the CDR in LR4. It also need to support tri-mode operation, the Serdes has to support both Ethernet and Non-Ethernet modes without significant increase in complexity/power. The delay from Serdes will larger than the LR4 spec.

SuggestedRemedy

We recommend the maximum delay to be relaxed to 200ns to prevent un-necessary penalties in power, complexity, and timeframe for product availability.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.
[Editor's note: Comment type set to T]

See Response to comment #5

Cl 89 SC 89.1 P31 L7 # 12
Dawe, Piers IPtronics

Comment Type TR Comment Status D

Here the text has to come clean and admit what sort of PMD this is.

SuggestedRemedy

Add a sentence saying this PMD is intended to provide optical compatibility with XXX. Insert name of ITU-T PMD type. Add reference (which may be informative, for the bibliography).

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.
Insert after the first sentence of 89.1:
"It is intended that devices compliant with this specification can also be compliant with application VSR2000-3R2 as defined in ITU-T G.693 [Bx1]. The specifications in this clause therefore use a similar methodology to that used in ITU-T G.693 [Bx1], which is different from the methodology used in the other 40GBASE-R optical PMDs."

In Annex A insert:

"[Bx1] ITU-T G.693—Optical interfaces for intra-office systems."

Cl 89 SC 89.10 P44 L47 # 1
Scott, Kipp Brocade

Comment Type T Comment Status D

Why do we quote two different standards for the attenuation of the optical fiber? If there was a small difference between them, it wouldn't be a big deal, but either 0.28 (ITU-T G.695) or 0.5 (ANSI/TIA/EIA 568B.3-2000) dB/km seems like a big difference.

Clause 38.11.1 of 802.3-2008 gives an attenuation of 0.5 (no reference) dB/km at 1310nm. Clause 52.14.2 of 802.3-2008 gives an attenuation of 0.4 (ITU-T G.652) and 0.5 (ANSI/TIA/EIA 568B.3-2000) dB/km at 1310nm and no attenuation for 1550nm.

SuggestedRemedy

It's great having so many standards to choose from. I don't understand why the attenuation is as high as 0.5dB/km when the 1550nm band is usually so low. Select the 0.28 dB/km.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.
[Editor's note: Clause changed from 89.10 to 89 and Subclause changed from Table 89-14 to 89.10]

Choosing 0.28 dB/km would result in an allocation of only 0.56 dB for the fibre loss of a 2 km link. This seems unnecessarily tight.
For changes to the draft see Response to comment #3

Cl 89 SC 89.6 P38 L16 # 2
Scott, Kipp Brocade

Comment Type TR Comment Status D

The cabled optical fiber attenuation of 1dB/km conflicts with the other attenuations in Table 89-14. 1dB/km attenuation seems unnecessarily high.

SuggestedRemedy

Change the dB/km to the same as those in Table 89-14.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.
[Editor's note: Clause changed from 89.6 to 89 and Subclause set to 89.6]

See Response to comment #3

Cl 89 SC 89.6.1 P37 L14 # 18
Dawe, Piers IPtronics

Comment Type TR Comment Status D

The only things controlling transmitter penalty that I can see are the eye mask and RIN specs. An implementer could make a horrible transmitter as long as he got the dispersion penalty OK, and call it compliant - probably a lot worse than what is shipped in the SONET/OTN market now.

SuggestedRemedy

As TDP testing can be a subset of DP, after the reference transmitter/sensitivity has been established as a one-off, using a TDP spec will be a cost-effective way to plug the gap and avoid giving the receiver such a hard time.

Proposed Response Response Status W

PROPOSED REJECT.
TDP testing would be inconsistent with Motion #1 from the Geneva Task Force meeting in May 2010:
Move to adopt the ITU-T style of optical power budget specification as proposed in slide 4 of anslow_03_0510.
Y: 32, N: 0, A: 0

Cl 89 SC 89.6.1 P37 L25 # 4
Anslow, Peter Ciena

Comment Type T Comment Status D

This comment is in support of the choice of Tx eye mask values of {0.25, 0.4, 0.45, 0.22, 0.25, 0.4} as already in D 1.0

SuggestedRemedy

Review presentation in anslow_03_0710.pdf justifying these values as adopted by ITU-T

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.
Make no change to the draft.

Cl 89 SC 89.6.2 P37 L44 # 14
Dawe, Piers IPtronics

Comment Type TR Comment Status D

The "Receiver sensitivity" entry is misleading because this "Receiver sensitivity" is so different in character to the many other optical receiver sensitivity specifications, which are unstressed sensitivity unless they say they are stressed sensitivity. This is something in between.

SuggestedRemedy

Use a proper stressed sensitivity or change "Receiver sensitivity" to "Part-stressed receiver sensitivity", here and in 89.7.9.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.
In Table 89-7 add a footnote to "Receiver sensitivity (average power)" to say:
"Receiver sensitivity (average power) is defined in 89.7.9 and has to be met with a transmitter with worst-case transmit eye, extinction ratio, transmitter reflectance and RIN200MA."

Cl 89 SC 89.6.2 P37 L47 # 7
SHANG, SONG SEMTECH CORP

Comment Type ER Comment Status D

The Rx 3dB BW (max) in Table 89-7 is related to the stressed receiver sensitivity (SRS). In FR, the jitter tolerance is defined as 1 dB penalty at BER = 1E-10. The 3dB BW should be defined consistently.

SuggestedRemedy

Suggest changing the BW definition to be consistent with jitter tolerance. In Subclause 89.7.11, a new method for the electric upper cut-off frequency should be updated without using SRS.

Proposed Response Response Status W

PROPOSED REJECT.

The Receiver 3 dB electrical upper cutoff frequency is not related to SRS. Limiting the 3 dB bandwidth of the receiver in this way means that the dispersion penalty seen by the target receiver should not be too different from that measured in 89.7.5

See also Response to comment #8

Cl 89 SC 89.6.3 P38 L1 # 13
Dawe, Piers IPtronics

Comment Type TR Comment Status D

Table 89-9 says it is a "illustrative link power budget". 802.3 optical PMDs have had tables like this since Table 38-9-Worst-case 1000BASE-LX link power budget and penalties (about 15 years ago), and they always show the WHOLE budget, from perfect transmitter to unstressed sensitivity. This one is different, as it uses a part-stressed sensitivity and therefore, omits the transmitter penalty. This is highly misleading as it gives the impression of a really easy PMD type (only 2 dB penalties listed) while actually, this is a fairly demanding PMD type, with possibly high penalties, which needs a good receiver.

SuggestedRemedy

At a bare minimum, for this cycle only, add footnote "This budget does not include the transmitter penalty" and change the title of subclause and table from "40GBASE-FR illustrative link power budget" to "40GBASE-FR illustrative loss and dispersion budget." Better, and in a future draft, increase the "power budget" and "allocation for penalties" items by the worst transmitter penalty allowed. Then we would not need the footnote or title changes.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.
In Table 89-8, add a footnote to "Power budget" and "Allocation for penalties" of:
"This budget does not include the effect of a non-ideal transmitter waveform."

Cl 89 SC 89.6.3 P38 L17 # 3
Anslow, Peter Ciena

Comment Type T Comment Status D

The channel insertion loss is 4 dB to match the budget from VSR2000-3R2. The connector and splice loss assumed in 89.10.2.1 is 2 dB. This leaves 2 dB for the fibre loss. For a 2 km reach, this equates to an insertion loss of the fibre of 1 dB/km which does not match the usual 0.5 dB/km

SuggestedRemedy

In 89.10.2.1 change the assumed connector and splice loss to 3 dB with an example of six connections of 0.5 dB each.
In Table 89-8 change "attenuation of 1 dB/km" to "attenuation of 0.5 dB/km" in footnote a
In Table 89-14 remove the 0.28 dB/km and footnote a (leaving the 0.5 dB/km and footnote b)

Proposed Response Response Status W

PROPOSED ACCEPT.

Cl 89 SC 89.7.1 P39 L11 # 15
Dawe, Piers IPtronics

Comment Type T Comment Status D

In Table 88-11, the patterns for BER-related items (TDP and stressed receiver sensitivity) are 3 or 5. Here in Table 89-10, for Dispersion penalty, Receiver sensitivity, and Receiver jitter tolerance, we have "3, 5 or valid 40GBASE-R signal". Surely the issues are the same. Has something changed?

SuggestedRemedy

Change these to "3 or 5" or plan to change 802.3ba tables the other way.

Proposed Response Response Status W

PROPOSED REJECT.
The PMDs in 802.3ba are all parallel formats, whereas 40GBASE-FR is serial. This makes it relatively straightforward to perform these tests for -FR using a "valid 40GBASE-R signal".

Cl 89 SC 89.7.11 P42 L24 # 8
SHANG, SONG SEMTECH CORP

Comment Type ER Comment Status D

Receiver BW test method reference to 52.9.11 is not consistent with FR, where jitter tolerance is defined differently. In 52.9.11 test method, the stressed receiver sensitivity is used for the test. There is no SRS defined in FR.

SuggestedRemedy

Suggest Editor to write a new Rx BW test method which is consistent to jitter tolerance in FR.

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

The test method in 52.9.11 is not related to jitter. The RF modulation is amplitude, not phase, so there is no need to make changes due to the different jitter tolerance in 40GBASE-FR.

"if measured as described in 52.9.11."

to

"if measured as described in 52.9.11 with the exception that the optical power level used in 52.9.11 b) is approximately equal to the receiver sensitivity level in Table 89-7."

See also Response to comment #7

Cl 89 SC 89.7.9 P41 L43 # 16
Dawe, Piers IPtronics

Comment Type T Comment Status D

This recipe for receiver testing "This shall be met with a transmitter with worst-case transmit eye, extinction ratio, transmitter reflectance and RIN200MA." is vague, therefore likely to cause disagreement be expensive to someone in the long run as well as likely not to be applied thoroughly and consistently. There should be a clear recipe for a (part)-stressed sensitivity procedure, although we add words saying that people can use other methods if they want to. We made good progress on stressed eye generation in 802.3ba; we can leverage that.

SuggestedRemedy

Say that the methods of 87.8.11 may be used with appropriate exceptions.

Proposed Response Response Status W

PROPOSED REJECT.

Using the methods of 87.8.11 would be inconsistent with Motion #1 from the Geneva Task Force meeting in May 2010:

Move to adopt the ITU-T style of optical power budget specification as proposed in slide 4 of anslow_03_0510.

Y: 32, N: 0, A: 0

Cl 89 SC 89.7.9 P41 L43 # 17
Dawe, Piers IPtronics

Comment Type TR Comment Status D

As this appears to be a dispersion-limited link (not loss-limited), testing the receiver without the dispersion penalty is missing the point.

SuggestedRemedy

Include the 2 dB dispersion penalty in the receiver spec.

If you believe in eye mask specs only, you could specify an eye at TP3 for this, and/or as a transmitter requirement.

Proposed Response Response Status W

PROPOSED REJECT.

Including the dispersion penalty in the receiver spec would be inconsistent with Motion #1 from the Geneva Task Force meeting in May 2010:

Move to adopt the ITU-T style of optical power budget specification as proposed in slide 4 of anslow_03_0510.

Y: 32, N: 0, A: 0

Cl 99 SC 99 P2 L1 # 20
Dawe, Piers IPtronics

Comment Type T Comment Status D

Draft says "This amendment to IEEE Std 802.3–2008 specifies a new PMD...". Yet the intention is to be optically compatible with an existing ITU-T PMD. It's not new, with a free choice to optimise the spec, and you should not mislead the reviewers into thinking that it is.

SuggestedRemedy

Delete "new".

Proposed Response Response Status W

PROPOSED REJECT.

This is a new PMD since there is no existing PMD for 40G serial. The fact that the optical parameters are intended to be consistent with ITU-T optical parameters at different rates does not stop it from being a new PMD.

Cl 99 SC 99 P5 L10 # 19
Dawe, Piers IPtronics

Comment Type T Comment Status D

Draft says "This amendment adds a new Physical Layer." But it's not new (essentially this draft re-uses an ITU PMD type) and the content of the draft is not a whole Physical Layer, it's a PMD, using existing interfaces. Anyway, there is only one Physical Layer; there might be different Physical Layer types.

SuggestedRemedy

Change to "This amendment adds a PMD type and management parameters for 40 Gb/s operation over single-mode fiber."

Proposed Response Response Status W

PROPOSED ACCEPT IN PRINCIPLE.

Change from "This amendment adds a new Physical Layer and management parameters for 40 Gb/s operation over single-mode fiber."

to

"This amendment adds a new PMD type and management parameters for 40 Gb/s operation over single-mode fiber."

Cl **A** SC **A** P**51** L**10** #

Dawe, Piers IPtronics

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

Please add the related ITU-T document to the bibliography.

SuggestedRemedy

Proposed Response Response Status **W**

PROPOSED ACCEPT IN PRINCIPLE.

See Response to comment #12