Cl **30** *SC* **30.5.1.1.2** *P* **21** *L* *#* 2

BOURGART, Fabrice Orange

Comment Type **E** *Comment Status* **X**

No explanation is given on the change of naming convention moving from BX for 1Gb/s Bidi to the -BR extension.

SuggestedRemedy

Add for newcomers to the IEEE world a note explaining the reason since remains stable across the line rates in the document

Proposed Response *Response Status* **O**

Cl **30** *SC* **30.5.1.1.2** *P* **21** *L* **15** *#* 1

BOURGART, Fabrice Orange

Comment Type **E** *Comment Status* **X**

In the definition the wording is "supporting a dsitance of at least nn km". Since distances are related to operator engineering rules, unless hard limitations to distance are introduced, it would be safer to refer to actual optical budget enabled by module pairings

SuggestedRemedy

Refer to optical budget values later described in tables 158-16, 159-15 and 160-15

Proposed Response *Response Status* **O**

Cl **30** *SC* **30.5.1.1.2** *P* **21** *L* **15** *#* 3

BOURGART, Fabrice Orange

Comment Type **E** *Comment Status* **X**

From the definitions no clue is given on the purpose of BR40+ vs BR40 before table 158-10

SuggestedRemedy

Purpose should preferably be explained sooner than it is now not to onfuse the reader

Proposed Response *Response Status* **O**

Cl **56** *SC* **56.1.1.1** *P* **34** *L* **20** *#* 4

BOURGART, Fabrice Orange

Comment Type **E** *Comment Status* **X**

Possible typo in the sentence "The 1000BASE-X PCS and PMA sublayers are used to support a bit rate of 100 Mb/s as defined in 66.2"

SuggestedRemedy

may be 100Mb/s should be made 1000Mb/s

Proposed Response *Response Status* **O**

Cl **56** *SC* **56.1.1.2** *P* **34** *L* **28** *#* 5

BOURGART, Fabrice Orange

Comment Type **E** *Comment Status* **X**

Added value of the copper references is unsure, here unless for a bug fixing not related to this work?

SuggestedRemedy

Remove from this text ?

Proposed Response *Response Status* **O**

Cl **56** *SC* **Table 56-1** *P* **37** *L* **6** *#* 6

BOURGART, Fabrice Orange

Comment Type **T** *Comment Status* **X**

4 module types have been defined to cover distances up to 40, two of them tagged "40" this will probably result in splitting the market and will cause inventory problems with related OPEX costs if link engineering is required.

SuggestedRemedy

Based on the experience and best practices that opto-electronic manufacturers have developed for PONs, it is believed that thanks to a 15dB dynamic the full range of distances/budgets could be covered with only two module types 0-15dB & 10 - 2x dB. Furthermore this could solve some issues documented in the next comments

Proposed Response *Response Status* **O**

Cl **56** *SC* **Table 56-1** *P* **37** *L* **6** *#* 7

BOURGART, Fabrice Orange

Comment Type **T** *Comment Status* **X**

Since distances are made uncertain because of very diverse passive plant engineering rules, it would be safer to refer to optical budgets

SuggestedRemedy

Replace the column with distances by optical budget classes enabled by the modules specified

Proposed Response *Response Status* **O**

Cl **158** *SC* **158.5.6** *P* **41** *L* **53** *#* 16

Wey, Jun Shan ZTE TX Inc.

Comment Type **ER** *Comment Status* **X**

Typos in this sentence: "PMDs compliant with this clause shall include the The PMD_global_transmit_disable function which allows the optical transmitter to be disabled.is optional."

SuggestedRemedy

Remove the repeated "the". Delete the "." between disabled and is.

Proposed Response *Response Status* **O**

Cl **158** *SC* **158.6** *P* **53** *L* *#* 17

Wey, Jun Shan ZTE TX Inc.

Comment Type **TR** *Comment Status* **X**

It is unclear what the loss budget for BR40+ is. It would be helpful to show a table of max and min loss for each transmission class

SuggestedRemedy

Describe the loss budget for BR40+

Proposed Response *Response Status* **O**

Cl **158** *SC* **158.6.1** *P* **54** *L* **21** *#* 18

Wey, Jun Shan ZTE TX Inc.

Comment Type **TR** *Comment Status* **X**

Table 158-6. PMD values for BR20 and BR40+ are the same

SuggestedRemedy

Correct the values for BR20

Proposed Response *Response Status* **O**

Cl **158** *SC* **158.6.1** *P* **55** *L* **12** *#* 19

Wey, Jun Shan ZTE TX Inc.

Comment Type **TR** *Comment Status* **X**

Table 158-7. PMD values for BR20 and BR40+ are the same

SuggestedRemedy

Correct the values for BR20

Proposed Response *Response Status* **O**

Cl **158** *SC* **158.10** *P* **65** *L* **1** *#* 20

Wey, Jun Shan ZTE TX Inc.

Comment Type **TR** *Comment Status* **X**

Table 158-16
To align with ITU-T G.9806 specifications, consider a 15dB dynamic range for the loss budget classes.
G.9806 draft spec: Class S (0-15dB), Class (10-25dB)
This comment also applies to Table 159-15.

SuggestedRemedy

Discussion needed

Proposed Response *Response Status* **O**

Cl **158** *SC* **158.11.2.1** *P* **66** *L* **13** *#* 14

BOURGART, Fabrice Orange

Comment Type **T** *Comment Status* **X**

A 2 dB allowance for connectors and splices independanlty of distance seems extremely short.

SuggestedRemedy

Is it safe to speculate in such details about engineerings that even operators struggle to express across their full footprint?

Proposed Response *Response Status* **O**

Cl **158** *SC* **Table 158-16** *P* **65** *L* **5** *#* 12

BOURGART, Fabrice Orange

Comment Type **T** *Comment Status* **X**

Note a) gives figures at 1310, while the window is at 1270nm

SuggestedRemedy

use attenuation covering the 1270nm window

Proposed Response *Response Status* **O**

Cl **158** *SC* **Table 158-17** *P* **65** *L* **49** *#* 13

BOURGART, Fabrice Orange

Comment Type **T** *Comment Status* **X**

Why not give the attenuation at both values applicable to the two wavelength windows used instead of 0.4 or 0.5 which are significantly different

SuggestedRemedy

figures must be made consistent across the tables 158-5, 158-10 and 158-17

Proposed Response *Response Status* **O**

Cl **158** *SC* **Table 158-10** *P* **58** *L* **9** *#* 11

BOURGART, Fabrice Orange

Comment Type **T** *Comment Status* **X**

Channel insertion loss with footnote d & e do not match what can be found in other tables at the relevant wavelengths.

SuggestedRemedy

Considering the table 158-17 lineic loss
10*.5 + 2 = 7dB > 6.2 dB

Proposed Response *Response Status* **O**

Cl **158** *SC* **Table 158-10** *P* **58** *L* **9** *#* 25

Rafel, Albert BT

Comment Type **TR** *Comment Status* **X**

Table 158-10 on Page 58 Clean version, channel insertion loss. Propose values for Channel Insertion Loss specification using BOTH minimum and maximum. Industrial temperature range assumption for specification. A 0.0 dB value for minimum insertion loss allows back to back testing and avoiding the use of an optical attenuator in practice on short links. The specification of minimum Channel Insertion Loss adds a test case for compliance

SuggestedRemedy

Propose adding a row in Table with a minimum Channel Insertion Loss with a value proposed of 0.0 dB. Change the value of 6.3 dB in Draft to a new value of 9.0 dB for maximum Channel Insertion Loss. The maximum Channel insertion loss of 9 dB can achieved by narrowing the transmit power range used for 6.3 dB.
Change 13 dB into 15 dB for max channel insertion loss, its min is 0 dB.
For 23 dB max channel insertion loss, its min value is 10 dB.
Remove 18 dB class.

Proposed Response *Response Status* **O**

Cl **158** *SC* **Table 158-10** *P* **58** *L* **9** *#* 29

Dawes, Peter — Vodafone

Comment Type **TR** *Comment Status* **X**

Channel insertion loss specs should be updated by providing the min and max values. Current values of 6.3 dB, 13 dB, 18 dB, and 23 dB should be updated.

Same comment applies to 25G loss in Clause 159 (Table 159-10) and 50G loss in Clause 160 (Table 160-10)

SuggestedRemedy

Propose to specify channel insertion loss as two rows in the table: one row for minimum value and the other for maximum value.
Propose to specify 3 classes as channel insertion loss: 0(min)-9 dB(max), 0-15 dB, and 10-23 dB.

Apply the above changes to Clauses 159 and 160.

Proposed Response *Response Status* **O**

Cl **158** *SC* **Table 158-10** *P* **58** *L* **9** *#* 27

Khotimsky, Denis — Verizon

Comment Type **TR** *Comment Status* **X**

Presently specified budget classes barely hold even under the fiber attenuation assumptions listed in the corresponding tables (Tab 158-10, 159-10, 160-10). Normally, fiber distance increase comes at least with the proportional number of splices, which contribute to the insertion loss. I would suggest redefining the power classes.

Same comment applies to Tables 158/159/160-5, 158/159/160-6, 158/159/160-7, 158/159/160-8, 158/159/160-9, 159/160-10

SuggestedRemedy

Propose to specify budget loss as the follwing three classes:
0(min)-9 dB(max),
0(min)-15 dB(max), and
10(min)-23 dB(max).

Apply the above changes to Tables 158/159/160-5, 158/159/160-6, 158/159/160-7, 158/159/160-8, 158/159/160-9, 159/160-10

Proposed Response *Response Status* **O**

Cl **158** *SC* **Table 158-5** *P* **53** *L* **45** *#* 8

BOURGART, Fabrice — Orange

Comment Type **T** *Comment Status* **X**

"Minimum range" values don't seem practical given the figures and assumptions given later in the section.

SuggestedRemedy

Either assuptions need to be changed or minimum range values. For instance given the lineic loss of fibre (0.4 or 0.5 according to table 158-17) at the considered wavelengths, the dynamic of fibre loss between 0m and 40km exceeds 16dB can it be achieved wihout specific external conditions (e.g. attenuators?).

Proposed Response *Response Status* **O**

Cl **158** *SC* **Table 158-5** *P* **53** *L* **45** *#* 9

BOURGART, Fabrice — Orange

Comment Type **T** *Comment Status* **X**

Considering the up and down link chracteristics, the damage threshold seems lower than the Tx max with modulation of the corresponding device.

SuggestedRemedy

Back to back testing should be made possible or testing conditions indicate that attenators are required given the current figures and testing is mentioned with a 2m patchcord (e.g. for BR40 & 40+)

Proposed Response *Response Status* **O**

Cl **158** *SC* **Table 158-6** *P* **54** *L* **20** *#* 37

Luo, Yuanqiu — Futurewei

Comment Type **TR** *Comment Status* **X**

In Table 158-6, row "Side Mode Suppression Ratio (min)", both 10GBASEBR20-D and 10GBASEBR40+-D values are empty

SuggestedRemedy

Propose to set these two values as 30 dB.

Proposed Response *Response Status* **O**

Cl **158** *SC* **Table 158-8** *P* **56** *L* **17** *#* 10

BOURGART, Fabrice — Orange

Comment Type **E** *Comment Status* **X**

No unit is given for the "Maximum receive power (for damage)"

SuggestedRemedy

Should it be "dBm" ?

Proposed Response *Response Status* **O**

Cl **159** *SC* **6.1** *P* **78** *L* **8** *#* 31

Frank, Effenberger — Futurewei Technologies

Comment Type **T** *Comment Status* **X**

To optimize the wavelengths for BR20 and higher, we should use a more standard wavelength. The dispersion impacts can be found in Liu_3cp_1_1909.

SuggestedRemedy

THe upstream wavelength should be 1260 to 1280 nm. This requires a chirped transmitter, but such chirp comes for free from DMLs. DML's are cheaper and higher power than EMLs, so this seems to be a no brainer. And, by shifting to a shorter wavelength, the guard band between up and down becomes 20nm, which is much more forgiving.

If accepted, this would affect tables 159-6, 7, 8, and 9; and tables 160-6, 7, 8, and 9.

Proposed Response *Response Status* **O**

Cl **159** *SC* **6.1** *P* **78** *L* **8** *#* 34

Frank, Effenberger — Futurewei Technologies

Comment Type **T** *Comment Status* **X**

To optimize the wavelengths for BR20 and higher, we should use a more standard wavelength. The dispersion impacts can be found in Liu_3cp_1_1909.

SuggestedRemedy

THe upstream wavelength should be 1260 to 1280 nm. This requires a chirped transmitter, but such chirp comes for free from DMLs. DML's are cheaper and higher power than EMLs, so this seems to be a no brainer. And, by shifting to a shorter wavelength, the guard band between up and down becomes 20nm, which is much more forgiving.

If accepted, this would affect tables 159-6, 7, 8, and 9; and tables 160-6, 7, 8, and 9.

Proposed Response *Response Status* **O**

Cl **159** *SC* **6.1** *P* **113** *L* **8** *#* 30

Frank, Effenberger — Futurewei Technologies

Comment Type **T** *Comment Status* **X**

To optimize the wavelengths for BR20 and higher, we should use standard wavelengths. The dispersion impacts can be found in Liu_3cp_1_1909.

SuggestedRemedy

THe downstream wavelength should be specified 1300-1320 nm. Given the distance and dispersion, this band would require a chirp-free Tx, which is not too bad. The width also enables uncooled operation (potentially).

Proposed Response *Response Status* **O**

Cl **159** *SC* **6.1** *P* **113** *L* **8** *#* 33

Frank, Effenberger — Futurewei Technologies

Comment Type **T** *Comment Status* **X**

To optimize the wavelengths for BR20 and higher, we should use standard wavelengths. The dispersion impacts can be found in Liu_3cp_1_1909.

SuggestedRemedy

THe downstream wavelength should be specified 1300-1320 nm. Given the distance and dispersion, this band would require a chirp-free Tx, which is not too bad. The width also enables uncooled operation (potentially).

Proposed Response *Response Status* **O**

Cl **159** *SC* **159.6** *P* **113** *L* **12** *#* 22

Wey, Jun Shan — ZTE TX Inc.

Comment Type **TR** *Comment Status* **X**

Table 159-6
BR20 transmitter has a dynamic range of 14dB, while the other classes are at 9dB, 4dB. Why such a high dynamic range for this class?

SuggestedRemedy

Discussion needed

Proposed Response *Response Status* **O**

Cl **159** *SC* **159.6** *P***114** *L***12** *#* 23

Wey, Jun Shan ZTE TX Inc.

Comment Type **TR** *Comment Status* **X**

Table 159-7
BR20 transmitter has a dynamic range of 14dB, while the other classes are at 9dB, 4dB. Why such a high dynamic range for this class?

SuggestedRemedy

Discussion needed

Proposed Response *Response Status* **O**

Cl **159** *SC* **159.6.3** *P***113** *L***1** *#* 21

Wey, Jun Shan ZTE TX Inc.

Comment Type **TR** *Comment Status* **X**

Table 159-6
Wavelength plan for BR20/40/40+ only allows a 4nm guard band between upstream and downstream. This will be challenging to meet with low cost optics

SuggestedRemedy

Discussion needed

Proposed Response *Response Status* **O**

Cl **159** *SC* **Table 159-10** *P***81** *L***4** *#* 28

McCammon, Kent AT&T

Comment Type **TR** *Comment Status* **X**

Table 159-10 on Page 81 Clean version, row 4. Propose values for Channel Insertion Loss specification using BOTH minimum and maximum. Industrial temperature range assumption for specification. A 0.0 dB value for minimum insertion loss allows back to back testing and avoiding the use of an optical attenuator in practice on short links. The specification of minimum Channel Insertion Loss adds a test case for compliance.

SuggestedRemedy

Propose adding a row in Table with a minimum Channel Insertion Loss with a value proposed of 0.0 dB. Change the value of 6.3 dB in Draft to a new value of 9.0 dB for maximum Channel Insertion Loss. The maximum Channel insertion loss of 9 dB might be achieved by narrowing the transmit power range used for 6.3 dB.

Proposed Response *Response Status* **O**

Cl **159** *SC* **Table 159-10** *P***81** *L***4** *#* 24

Rafel, Albert BT

Comment Type **TR** *Comment Status* **X**

Table 159-10 on Page 81 Clean version, row 4. Propose values for Channel Insertion Loss specification using BOTH minimum and maximum. Industrial temperature range assumption for specification. A 0.0 dB value for minimum insertion loss allows back to back testing and avoiding the use of an optical attenuator in practice on short links. The specification of minimum Channel Insertion Loss adds a test case for compliance.

SuggestedRemedy

Propose adding a row in Table with a minimum Channel Insertion Loss with a value proposed of 0.0 dB. Change the value of 6.3 dB in Draft to a new value of 9.0 dB for maximum Channel Insertion Loss. The maximum Channel insertion loss of 9 dB can achieved by narrowing the transmit power range used for 6.3 dB.
Change 13 dB into 15 dB for max channel insertion loss, its min is 0 dB.
For 23 dB max channel insertion loss, its min value is 10 dB.
Remove 18 dB class.

Proposed Response *Response Status* **O**

Cl **159** *SC* **Table 159-5** *P***76** *L***27** *#* 15

BOURGART, Fabrice Orange

Comment Type **T** *Comment Status* **X**

Remarks done for table 158-5 about the dynamic "2m - max length" are also valid for clauses 159 and 160.

SuggestedRemedy

Realistic values based on possible damage and actual dynamic should be given.

Proposed Response *Response Status* **O**

Cl **160** *SC* **9** *P***111** *L***1** *#* 32

Frank, Effenberger Futurewei Technologies

Comment Type **T** *Comment Status* **X**

Table 160-14 should be made to follow the format of table 159-14, especially the wavelengths.

SuggestedRemedy

Simplest thing is to just copy the 159 table to here. Or just do it by reference.

Proposed Response *Response Status* **O**

Cl **160** *SC* **9** *P* **111** *L* **1** # 35

Frank, Effenberger — Futurewei Technologies

Comment Type **T** *Comment Status* **X**

Table 160-14 should be made to follow the format of table 159-14, especially the wavelengths.

SuggestedRemedy

Simplest thing is to just copy the 159 table to here. Or just do it by reference.

Proposed Response *Response Status* **O**

Cl **160** *SC* **160.6.3** *P* **101** *L* **35** # 38

Lewis, David — Lumentum

Comment Type **T** *Comment Status* **X**

In Table 160-10, Power budget (for maximum TDECQ) values should add up to Channel insertion loss plus Allocation for penalties (for maximum TDECQ).

SuggestedRemedy

Change values of Power budget (for maximum TDECQ) to: 10.1, 16.8, 21.8, and 26.8 for 50GBASE-BR10, -BR20, -BR40 and -BR40+ respectively.

Proposed Response *Response Status* **O**

Cl **160** *SC* **Table 160-10** *P* **101** *L* **42** # 26

Rafel, Albert — BT

Comment Type **TR** *Comment Status* **X**

Table 160-10 on Page 101 Clean version, channel insertion loss. Propose values for Channel Insertion Loss specification using BOTH minimum and maximum. Industrial temperature range assumption for specification. A 0.0 dB value for minimum insertion loss allows back to back testing and avoiding the use of an optical attenuator in practice on short links. The specification of minimum Channel Insertion Loss adds a test case for compliance

SuggestedRemedy

Propose adding a row in Table with a minimum Channel Insertion Loss with a value proposed of 0.0 dB. Change the value of 6.3 dB in Draft to a new value of 9.0 dB for maximum Channel Insertion Loss. The maximum Channel insertion loss of 9 dB can achieved by narrowing the transmit power range used for 6.3 dB.
Change 13 dB into 15 dB for max channel insertion loss, its min is 0 dB.
For 23 dB max channel insertion loss, its min value is 10 dB.
Remove 18 dB class.

Proposed Response *Response Status* **O**

Cl **160** *SC* **Table 160-7** *P* **98** *L* **53** # 36

Luo, Yuanqiu — Futurewei

Comment Type **TR** *Comment Status* **X**

In Table 160-7, row "Outer Optical Modulation Amplitude (OMAouter)(min)", the 50GBASE-BR20-U value should be about 5dB lower than that of the 50GBASE-BR40-U value.

SuggestedRemedy

Propose to change the OMAouter(min) value of 50GBASE-BR20-U from "3.4" into "-1.5".

Proposed Response *Response Status* **O**