802.3dj D2.1
Comment Resolution
Optical Track

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Introduction

- This slide package was assembled by the 802.3dj editorial team to provide background and detailed resolutions to aid in comment resolution.
- Specifically, these slides are for the various optical-track comments.

180, 181, 182 and 183 – TX FRx Comments #510-517

Cl **180** *SC* **180.9.7** *P* **464** *L* **23** # 510

Cole, Chris Coherent Corp.

Comment Type **T** *Comment Status* **X** *(LATE)*

Proposal is updated based on new work and data, as promised TF during Aug. meeting

SuggestedRemedy

Update per cole_3dj_01_2509 previewed in cole_3dj_01c_adhoc_250828

Proposed Response *Response Status* **W**

This comment was received after the Working Group ballot closed.

Cl **180** *SC* **180.9.7** *P* **464** *L* **37** # 511

Cole, Chris Coherent Corp.

Comment Type **T** *Comment Status* **X** *(LATE)*

Table 180-17 needs updating as per above

SuggestedRemedy

Replace Table 180-17 with table in cole_3dj_01_2509 previewed in cole_3dj_01c_adhoc_250828

Proposed Response *Response Status* **W**

This comment was received after the Working Group ballot closed.

Cl **180** *SC* **180.9.7.1** *P* **465** *L* **28** # 512

Cole, Chris Coherent Corp.

Comment Type **T** *Comment Status* **X** *(LATE)*

Equations 180-1 and 180-2 need updating as per above

SuggestedRemedy

Replace Table Equations 180-1 and 180-2 with equations in cole_3dj_01_2509 previewed in cole_3dj_01c_adhoc_250828

Proposed Response *Response Status* **W**

This comment was received after the Working Group ballot closed.

Cl **183** *SC* **183.9.7** *P* **557** *L* **47** # 517

Cole, Chris Coherent Corp.

Comment Type **T** *Comment Status* **X** *(LATE)*

Over-fiber test is added to verify functionality with impairments, mainly CD

SuggestedRemedy

Update per cole_3dj_01_2509 previewed in cole_3dj_01c_adhoc_250828

Proposed Response *Response Status* **W**

This comment was received after the Working Group ballot closed.

Cl **181** *SC* **181.9.7** *P* **495** *L* **8** # 513

Cole, Chris Coherent Corp.

Comment Type **T** *Comment Status* **X** *(LATE)*

Proposal is updated based on new work and data, as promised TF during Aug. meeting

SuggestedRemedy

No changes required except possibly to equation 180-2 reference, as per changes above

Proposed Response *Response Status* **W**

This comment was received after the Working Group ballot closed.

Cl **181** *SC* **181.9.7** *P* **495** *L* **1** # 514

Cole, Chris Coherent Corp.

Comment Type **T** *Comment Status* **X** *(LATE)*

Over-fiber test is added to verify functionality with impairments, mainly CD

SuggestedRemedy

Update per cole_3dj_01_2509 previewed in cole_3dj_01c_adhoc_250828

Proposed Response *Response Status* **W**

This comment was received after the Working Group ballot closed.

Cl **182** *SC* **182.9.7** *P* **526** *L* **26** # 515

Cole, Chris Coherent Corp.

Comment Type **T** *Comment Status* **X** *(LATE)*

Proposal is updated based on new work and data, as promised TF during Aug. meeting

SuggestedRemedy

No changes required except possibly to equation 180-2 reference, as per changes above

Proposed Response *Response Status* **W**

This comment was received after the Working Group ballot closed.

Cl **183** *SC* **183.9.7** *P* **558** *L* **1** # 516

Cole, Chris Coherent Corp.

Comment Type **T** *Comment Status* **X** *(LATE)*

Proposal is updated based on new work and data, as promised TF during Aug. meeting

SuggestedRemedy

No changes required except possibly to equation 180-2 reference, as per changes above

Proposed Response *Response Status* **W**

This comment was received after the Working Group ballot closed.

Proposed updates to 180.9.7 highlighted in red

180.9.7 Transmitter functional symbol error histogram

The transmitter functional symbol error histogram mask for each lane is given in Table 180–17. The transmitter functional symbol error histogram is measured using a functional receiver as defined in 180.9.7.1 using the method defined in 180.9.7.2. The transmitter functional symbol error histogram is measured using the test pattern defined in Table 180–14.

The transmitter functional error mask is the maximum probability of having exactly *n* symbol errors in a single ~~codeword~~ test block. The error mask, calculated based on 174A.8.5 using BER = 2.4 × 10–5 and ~~p~~ *p* = 1, is listed in Table 180–17. *Test_margin*, defined in 180.9.7.1, determines the input BER.

For those cases where there is an xAUI-n chip-to-chip (C2C) or chip-to-module (C2M) interface (see Table 180–1 through Table 180–4), the clock source for the test pattern is derived from the clock recovered from the xAUI-n input signal. The pattern of the xAUI-n input signal may be PRBS31Q, scrambled idle, or a valid xBASE-R signal.

Current Table 180-17

Table 180–17—Transmitter functional symbol error mask

Test symbol errors per test block, k (see 174A.8.5)	Probability $H_{max}(k)$
1	1.15×10^{-1}
2	7.47×10^{-3}
3	3.24×10^{-4}
4	1.05×10^{-5}
5	2.73×10^{-7}
6	5.88×10^{-9}
7	1.08×10^{-10}
8	1.75×10^{-12}
9	2.5×10^{-14}
10	3.21×10^{-16}
11	3.74×10^{-18}
12	3.98×10^{-20}
13	3.91×10^{-22}
14	3.56×10^{-24}
15	3.02×10^{-26}
16	2.4×10^{-28}

Table 180–17—Transmitter functional symbol error mask

Proposed updates to Table 180-17

Table 180-17 Transmitter functional symbol error mask

Test symbol errors per test block, *k* (see 174A.8.5)	Probability *Hmax*(*k*)
1	1.15×10^{-1}
2	7.47×10^{-3}
3	3.24×10^{-4}
4	1.05×10^{-5}
5	2.73×10^{-7}
6	5.88×10^{-9}
7	1.08×10^{-10}
8	1.75×10^{-12}
9	3.50×10^{-13}
10	3.50×10^{-13}
11	3.50×10^{-13}
12	3.50×10^{-13}
13	3.50×10^{-13}
14	3.50×10^{-13}
15	3.50×10^{-13}
16	3.50×10^{-13}

With Table footnotes a and b for Probability Hmax(k)

A: The probability for test symbols 9 through 16 is consistent with Hmax16 for a BER of 2.28e-4 as specified in 174A.8.5

B: The mask is derived using an input BER of 2.40×10^{-5}

Current 180.9.7.1

180.9.7.1 Functional receiver (FRx) definition

The functional receiver is an optical receiver, independent of the transmitter under test, that meets the requirements of Table 180–17 with a variable optical attenuator (VOA) placed before the input which is set to achieve functional receiver (FRx) OMA as defined in Equation (180–1).

For those cases where there is an xAUI-n chip-to-chip (C2C) or chip-to-module (C2M) interface (see Table 180–1 through Table 180–4), the clock source for the test pattern is derived from the clock recovered from the xAUI-n input signal. The pattern of the xAUI-n input signal may be PRBS31Q, scrambled idle, or a valid xBASE-R signal.

$$FRx\_OMA = Tx\_OMA - \max(Tx\_TDECQ - Tx\_TECQ, 0) - RxS\_TECQ\_correction - Channel\_insertion\_loss - MPI\_DGD\_penalty\_allocation + Tx\_test\_margin \quad (180\text{–}1)$$

where:

- *Tx_OMA* is the outer optical modulation amplitude (OMAouter) measured for the transmitter under test
- *Tx_TDECQ* is the TDECQ measured for the transmitter under test
- *Tx_TECQ* is the TECQ measured for the transmitter under test
- *RxS_TECQ_correction*, as given by Equation (180–2), is the deviation between the optical receiver sensitivity and the minimally compliant receiver sensitivity specified in Figure 180–4, at *Tx_TECQ*
- *Channel_insertion_loss* is “Channel insertion loss” given in Table 180–9
- *MPI_DGD_penalty_allocation* is “MPI DGD penalty allocation” as given in Table 180–9
- *Tx_test_margin* is equal to 1.5 dB

$$RxS\_TECQ\_correction = RxS\_OMA\_max - FRx\_RxS \quad (180\text{–}2)$$

where:

- *FRx_RxS* is the “receiver sensitivity (OMAouter), each lane” measured using the method defined in 180.9.13
- *RxS_OMA_max* is the “receiver sensitivity (OMAouter), each lane (max)” is as given in Table 180–8

Proposed updates to 180.9.7.1 (part 1)

180.9.7.1 Functional receiver (FRx) definition

The Functional Receiver (FRx) is a variable optical attenuator (VOA) followed by an Optical Receiver (ORx) that complies with characteristics in Table 180-8. VOA level is given by equation (180-1). Tx_DUT is connected to FRx by short Test SMF, or patch cord.

VOA_level = Tx_DUT_power_budget - Test_SMF_power_budget - ORx_TECQ_allocation

- Test_margin (180-1)

Where:

— *Tx_DUT_power_budget* added to *RxS_OMA@TECQ*=0 gives *Tx_DUT_OMA*(min) in Table 180-7 and is given by equation (180-2).

— *Test_SMF_power_budget* is the sum of Test SMF MPI, DGD and DUT CD penalty estimates and is given in equation (180-3).

— *ORx_TECQ_allocation* is the difference between *ORx_RxS@*DUT_TECQ and *RxS_OMA@*TECQ=0 and is given by equation (180-4).

— *Test_margin* is additional *ORx_OMA which reduces operating BER and* equals 1.5dB.

Proposed updates to 180.9.7.1 (part 2)

Tx_DUT_power_budget = *Channel_insertion_loss* + *MPI+DGD_penalty_allocation*

+ max(*DUT_TDECQ, DUT_TECQ*) (180–2)

where above:

— *Channel_insertion_loss* is “Channel insertion loss” given in Table 180–9

— *MPI_DGD_penalty_allocation* is “MPI DGD penalty allocation” given in Table 180–9

— *DUT_TDECQ* is the TDECQ measured for the Tx DUT

— *DUT_TECQ* is the TECQ measured for the Tx DUT

Test_SMF_power_budget = *Test_SMF_loss* + *Test_SMF_MPI* + *DGD_penalty*

+ *Test_SMF_DUT_CD* (180-3)

Proposed updates to 180.9.7.1 (part 3)

where above:

— *Test_SMF_loss* is an estimate of the actual channel insertion loss of the Test SMF

— *Test_SMF_MPI+DGD_penalty* is an estimate of the actual MPI and DGD penalty of the Test SMF

— *Test_SMF_DUT_CD* is an estimate of the Tx DUT actual CD penalty over the Test SMF.

— *Test_SMF_power_budget*, loss and penalty terms are zero.

ORx_TECQ_allocation = *ORx_RxS@DUT_TECQ* - *RxS_OMA*@TECQ=0 (180–4)

where:

— *ORx_RxS@DUT_TECQ* is the ORx RxS at the TECQ measured for the Tx DUT

— *RxS_OMA@TECQ=0* is the RxS OMA extrapolated down to TECQ=0 and is given in Table 180-8 for TECQ >=0.9dB (-4.3dBm)

Current 181.9.7

181.9.7 Transmitter functional symbol error histogram

The transmitter functional symbol error histogram mask for each lane is given in Table 180–17. The transmitter functional symbol error histogram is measured using the method defined in 180.9.7 with the following exceptions:

- The transmitter functional symbol error histogram is measured using the test pattern defined in Table 181–12.
- *RxS_TECQ_correction*, as given by Equation (180–2), is the deviation between the optical receiver sensitivity and the minimally compliant receiver sensitivity specified in Figure 181–4, at *Tx_TECQ*.
- *Channel_insertion_loss* is “Channel insertion loss” given in Table 181–7.
- *MPI_DGD_penalty_allocation* is “MPI DGD penalty allocation” as given in Table 181–7.
- *RxS_OMA_max* is the “receiver sensitivity (OMAouter), each lane (max)” is as given in Table 181–6.
- *FRx_RxS* is the “receiver sensitivity (OMAouter), each lane” measured using the method defined in 181.9.13.

Proposed updates to 181.9.7 (Part 1)

181.9.7 Transmitter functional symbol error histogram

The transmitter functional symbol error histogram mask for each lane is given in Table 180–17. The transmitter functional symbol error histogram is measured using the method defined in 180.9.7 with the following exceptions:

— The transmitter functional symbol error histogram is measured using the test pattern defined in Table 181–12.

— The Functional Receiver (FRx) is a variable optical attenuator (VOA) followed by an Optical Receiver (ORx) that complies with characteristics in Table 181-6. The VOA level is given by equation (180-1). Tx DUT is connected to FRx by longer Test SMF, or emulator mainly of chromatic dispersion penalty (CD), with compliance channel specifications in Table 181-14.

where in equation (180-1):

— *Tx_DUT_power_budget* added to *RxS_OMA@TECQ=0* gives Tx_DUT_OMA(min) in Table 181-5 and is given by equation (180-2).

Proposed updates to 181.9.7 (Part 2)

181.9.7 Transmitter functional symbol error histogram

where in equation (180-2):

— *Channel_insertion_loss* is “Channel insertion loss” given in Table 181-7

— *MPI_DGD_penalty_allocation* is “MPI DGD penalty allocation” given in Table 181-7

where in equation (180-3):

— *Test_SMF_power_budget,* loss and penalty terms are non-zero.

where in equation (180-4):

— *RxS_OMA@TECQ=0* is the RxS OMA extrapolated down to TECQ=0 and is given in Table 181-6 for TECQ >= 0.9dB (-4.1dBm).

Current 182.9.7

The transmitter functional symbol error histogram mask for each lane is given in Table 180–17. The transmitter functional symbol error histogram is measured using the method defined in 180.9.7 with the following exceptions:

— The transmitter functional symbol error histogram is measured using the test pattern defined in Table 182–14.

— *RxS_TECQ_correction*, as given by Equation (180–2), is the deviation between the optical receiver sensitivity and the minimally compliant receiver sensitivity specified in Figure 182–4, at *Tx_TECQ*.

— *Channel_insertion_loss* is "Channel insertion loss" given in Table 182–9.

— *MPI_DGD_penalty_allocation* is "MPI DGD penalty allocation" as given in Table 182–9.

— *RxS_OMA_max* is the "receiver sensitivity (OMAouter), each lane (max)" is as given in Table 182–8.

— *FRx_RxS* is the "receiver sensitivity (OMAouter), each lane" measured using the method defined in 182.9.13.

Proposed updates to 182.9.7 (Part 1)

182.9.7 Transmitter functional symbol error histogram

The transmitter functional symbol error histogram mask for each lane is given in Table 180–17. The transmitter functional symbol error histogram is measured using the method defined in 180.9.7 with the following exceptions:

— The transmitter functional symbol error histogram is measured using the test pattern defined in Table 182–14.

— The Functional Receiver (FRx) is a variable optical attenuator (VOA) followed by an Optical Receiver (ORx) that complies with characteristics in Table 182-8. The VOA level is given by equation (180-1). Tx_DUT is connected to FRx by short Test SMF, or patch cord.

where in equation (180-1):

— *Tx_DUT_power_budget* added to *RxS_OMA@TECQ=0* gives Tx_DUT_OMA(min) in Table 182-7 and is given by equation (180-2).

where in equation (180-2):

— *Channel_insertion_loss* is "Channel insertion loss" given in Table 182-9

— *MPI_DGD_penalty_allocation* is "MPI DGD penalty allocation" given in Table 182-9

Proposed updates to 182.9.7 (Part 2)

where in equation (180-3):

— *Test_SMF_power_budget,* loss and penalty terms are zero.

where in equation (180-4):

— *RxS_OMA@TECQ=0* is the RxS OMA extrapolated down to TECQ=0 and is given in Table 182-8 for TECQ >= 0.9dB (-5.3dBm).

Current 183.9.7

183.9.7 Transmitter functional symbol error histogram

The transmitter functional symbol error histogram mask for each lane is given in Table 180–17. The transmitter functional symbol error histogram is measured using the method defined in 180.9.7 with the following exceptions:

- The transmitter functional symbol error histogram is measured using the test pattern defined in Table 183–14.
- *RxS_TECQ_correction*, as given by Equation (180–2), is the deviation between the optical receiver sensitivity and the minimally compliant receiver sensitivity specified in Figure 183–4, at *Tx_TECQ*
- *Channel_insertion_loss* is "Channel insertion loss" given in Table 183–8
- *MPI_DGD_penalty_allocation* is "MPI DGD penalty allocation" as given in Table 183–8
- *FRx_RxS* is the "receiver sensitivity (OMAouter), each lane" measured using the method defined in 183.9.13
- *RxS_OMA_max* is the "receiver sensitivity (OMAouter), each lane (max)" is as given in Table 183–7

Proposed updates to 183.9.7 (Part 1)

183.9.7 Transmitter functional symbol error histogram

The transmitter functional symbol error histogram mask for each lane is given in Table 180–17. The transmitter functional symbol error histogram is measured using the method defined in 180.9.7 with the following exceptions:

— The transmitter functional symbol error histogram is measured using the test pattern defined in Table 183–14.

— The Functional Receiver (FRx) is a variable optical attenuator (VOA) followed by an Optical Receiver (ORx) that complies with characteristics in Table 183-7. The VOA level is given by equation (180-1). Tx DUT is connected to FRx by longer Test SMF, or emulator mainly of chromatic dispersion penalty (CD), with compliance channel specifications in Table 183-16.

where in equation (180-1):

— *Tx_DUT_power_budget* added to *RxS_OMA@TECQ=0* gives Tx_DUT_OMA(min) in Table 183-6 and is given by equation (180-2).

where in equation (180-2):

Proposed updates to 183.9.7 (Part 2)

— *Channel_insertion_loss* is “Channel insertion loss” given in Table 183-8

— *MPI_DGD_penalty_allocation* is “MPI DGD penalty allocation” given in Table 183-8

where in equation (180-3):

— *Test_SMF_power_budget,* loss and penalty terms are non-zero.

where in equation (180-4):

— *RxS_OMA@TECQ*=0 is the RxS OMA extrapolated down to TECQ=0 and is given in Table 183-7 for TECQ >= 0.9dB (-4.6dBm for FR4, -6.9dBm for LR4).

185A, 185 and 187 – ETCC reference equalizer Comments #438, 437, 439, 337, 338, 178

Cl **185A** *SC* **185A.2.3** *P* **913** *L* **17** # 437

Kota, Kishore Marvell Semiconductor

Comment Type **T** *Comment Status* **D** *Reference equalizer (O)*

The section which describes the offline digital signal processing needs to define the number of taps to be used in the "reference equalizer" and the "reference post-equalizer" blocks as parameters for the ETCC calculation.

SuggestedRemedy

Add a table defining key parameters for the digital signal processing used for ETCC calculation. Propose adding the number of taps in "Reference Equalizer" and "Reference Post-Equalizer" as parameters in this table. The values for these parameters will be defined by the PMD clauses which reference this Annex based on the requirements of the specific PMD clause.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Resolve using the response to comment #438

Cl **185** *SC* **185.8.6** *P* **608** *L* **4** # 438

Kota, Kishore Marvell Semiconductor

Comment Type **T** *Comment Status* **D** *Reference equalizer (O)*

Specify values for the parameters required in the digital signal processing for ETCC.

SuggestedRemedy

Add a table specifying values for the number of taps to be used for "Reference Equalizer" and "Reference Post-Equalizer" blocks. Presentation to be provided with specific values.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Pending review of the following presentations and CRG discussion.
<URL>/kota_3dj_xx_2509.pdf.

Cl **187** *SC* **187.8.6** *P* **682** *L* **45** # 439

Kota, Kishore Marvell Semiconductor

Comment Type **T** *Comment Status* **D** *Reference equalizer (O)*

Specify values for the parameters required in the digital signal processing for ETCC.

SuggestedRemedy

Add a table specifying values for the number of taps to be used for "Reference Equalizer" and "Reference Post-Equalizer" blocks. Presentation to be provided with specific values.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Resolve using the response to comment #438

185A, 185 and 187 – ETCC reference equalizer
Comments #438, 437, 439, 337, 338, 178

Cl **185A** *SC* **185A.2.3.7** *P* **914** *L* **29** # 338

Williams, Tom Cisco

Comment Type **TR** *Comment Status* **D** *Reference equalizer (O)*

The purpose of ETCC is to quantify the penalty due to transmitter-only impairments. The addition of the reference post equalizer in D2.1 is proposed to compensate for a transmitter-caused penalty (IQ skew) which allows poorer transmitters to pass the test and pushing the burden to the link receiver to compensate.

It is unclear if this reference post equalizer should remain in the specification.

However, to limit the burden to the link receiver, propose to limit the Reference Post equalizer to 5 taps and only in the through paths which is sufficient to address the skew. And a seperate 1-tap phase error correction.

A supporting presentation will be provided

SuggestedRemedy

Rewrite 185A.2.3.7 to:
A reference post-equalizer for each polarization is placed after the carrier phase recovery, and used to compensate for transmit I-Q skew and transmit I-Q phase error impairments.

The I-Q phase error is corrected via a 1-tap adaptive feed forward crosstalk cancellation between I-Q pairs.

The I-Q skew is corrected via four independent 5-tap adaptive T-spaced feed forward filters for each of the XI, XQ, YI, YQ signals, where T is the symbol period.

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Pending review of the following presentations and CRG discussion.
Align with the response to comment #438.
<URL>/williams_3dj_xx_2509.pdf.

Cl **185A** *SC* **185A.2.3** *P* **913** *L* **15** # 178

El-Chayeb, Ahmad Keysight Technologies (ahmad.el-chayeb@keysight.c

Comment Type **TR** *Comment Status* **D** *Reference equalizer (O)*

Reference equalizer and reference post-equalizer are missing to specify the respective number of taps.

SuggestedRemedy

Add definition tables for the number of taps for both the reference equalizer and the reference post-equalizer.
The actual numbers should then be specified respectively in sub-clauses 185.9 for LR1 and 187.9 for ER1 and ER1-20 as suggested in
https://www.ieee802.org/3/dj/public/25_07/kota_3dj_01a_2507.pdf

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Resolve using the response to comment #438
[Editor's note: changed page/line from 863/12]

Cl **185A** *SC* **185A.2.3.5** *P* **914** *L* **19** # 337

Williams, Tom Cisco

Comment Type **TR** *Comment Status* **D** *Reference equalizer (O)*

Reference equalizer misses to specify the number of taps.

A supporting presentation will be provided

SuggestedRemedy

Add a specified number of taps to the description.

Propose a 31 tap equalizer.

"... with an adaptive 31 tap T-spaced feed-forward equalizer ..."

Proposed Response *Response Status* **W**

PROPOSED ACCEPT IN PRINCIPLE.
Resolve using the response to comment #438
<URL>/williams_3dj_xx_2509.pdf.

185A, 185 and 187 – ETCC reference equalizer
Comments #438, 437, 439, 337, 338, 178

Accept in Principle.

Change 185.9 to

“The ETCC is computed using the test setup and calculation defined in Annex 185A and the parameter values listed in Table 185–12, Table 185–13 and Table 185-14.”

Add new subclause 185.9.3 “Offline DSP”

“The offline DSP parameters for the reference equalizers shall meet the values listed in Table 185–14.”

In 185.9.3 add new Table 185-14 titled “Offline DSP parameters” as shown below.

Parameter	Value	Unit
Number of reference equalizer taps	31	____
Number of reference post-equalizer taps	5	____

185A, 185 and 187 – ETCC reference equalizer
Comments #438, 437, 439, 337, 338, 178

Change 187.9 to

“The ETCC is computed using the test setup and calculation defined in Annex 185A and the parameter values listed in Table 187–12, Table 187–13 and Table 187-14.”

Add new subclause 187.9.3 “Offline DSP calculation”

“The offline DSP parameters for the reference equalizers shall meet the values listed in Table 187–14.”

In 187.9.3 add new Table 187-14 titled “Offline DSP parameters” as shown below.

Parameter	Value	Units
Number of reference equalizer taps	31	____
Number of reference post-equalizer taps	5	____

185A, 185 and 187 – ETCC reference equalizer Comments #438, 437, 439, 337, 338, 178

In 185A.2.3 add new Table 185A-3 titled "Offline DSP parameters" as shown below.

Parameter	Units
Number of reference equalizer taps	____
Number of reference post-equalizer taps	____

Replace 185A.2.3.7 with:

A reference post-equalizer for each polarization is placed after the carrier phase recovery, and used to compensate for transmit I-Q skew and transmit I-Q phase error impairments.

The I-Q phase error is corrected via a memoryless lattice adaptive feed forward crosstalk cancellation between I-Q pairs.

The I-Q skew is corrected via four independent adaptive T-spaced feed forward filters for each of the XI, XQ, YI, YQ signals, where T is the symbol period.

<clause> – <subtopic>
Comment #<comment number