



# ITU-T G.9806AM3 UPDATE

IEEE 802.3 WORKING GROUP PLENARY

TASK FORCE: GREATER THAN 50 GB/S BIDIRECTIONAL OPTICAL ACCESS PHYS

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# Background

- 100G-BiDi ad hoc group formed for G.9806Am3 is progressing discussion
  - Monthly meetings
  - Target date for consent of class S(0-15 dB) is the next ITU-T SG15 plenary on April 2023
  - Target date for consent of class B-(0-23 dB) is ITU-T SG15 plenary on November 2023
- This contribution updates the strawman PMD parameters discussed by 100G-BiDi ad hoc meeting
  - The main change is to split the class S budget into 2 ranges
    - S lower (0-10 dB)
    - and S upper (5-15dB)
  - Limits the link dynamic range
  - Alleviates potential Rx overload issue from previous Strawman

# Previous strawman

Items	Unit	S Class Specification
Modulation format		PAM4
Nominal modulation rate	Gbit/s	53.125
Wavelengths	nm	1304.6 ±1 nm, 1309.1 ±1 nm
Mean launch power MAX	dBm (AVP)	TBD
Launch power in OMA <sub>outer</sub> (min) - For TDECQ < 1.6 dB - For 1.6 dB < TDECQ < 3.6 dB	dBm	+3.0 <b>+1.4 + TDECQ</b>
Launch power in OMA <sub>outer</sub> minus TDECQ (min)	dBm	1.4
Transmitter and dispersion eye closure for PAM4 (TDECQ) max	dB	3.6
Receiver sensitivity (OMA) - For TECQ < 1.6 dB - For 1.6 dB < TECQ < 3.6 dB	dBm	-12.5 -14.1 + TECQ
Damage threshold MAX	dBm	TBD
TDECQ – TECQ  (max)	dB	2.5
Optical path penalty MAX (Informative)	dB	2.5
Extinction ratio MIN (Note 3)	dB	5.0
Bit error ratio		Less than 2.4 x 10 <sup>-4</sup>

Results in +5dBm OMA  
into APD Rx

# Increasing dynamic range

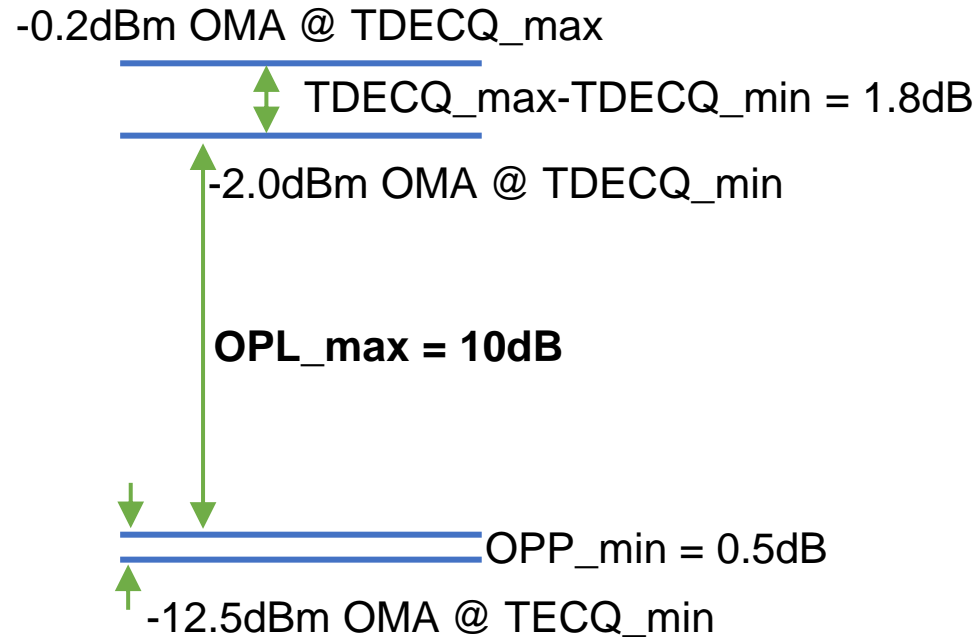
- The following have been considered to increase the dynamic range
  - Use of stronger FEC (e.g.  $1e-2$  BER from G.9804.2) to improve Rx sensitivity
  - Adaptive APD bias control to increase the overload
- Stronger FEC has been put to one side as network operators require full 100G service rate
- Adaptive APD bias control is understood to permit  $\sim 0$ dBm overload

# Strawman PMD parameters for G.9806Am3

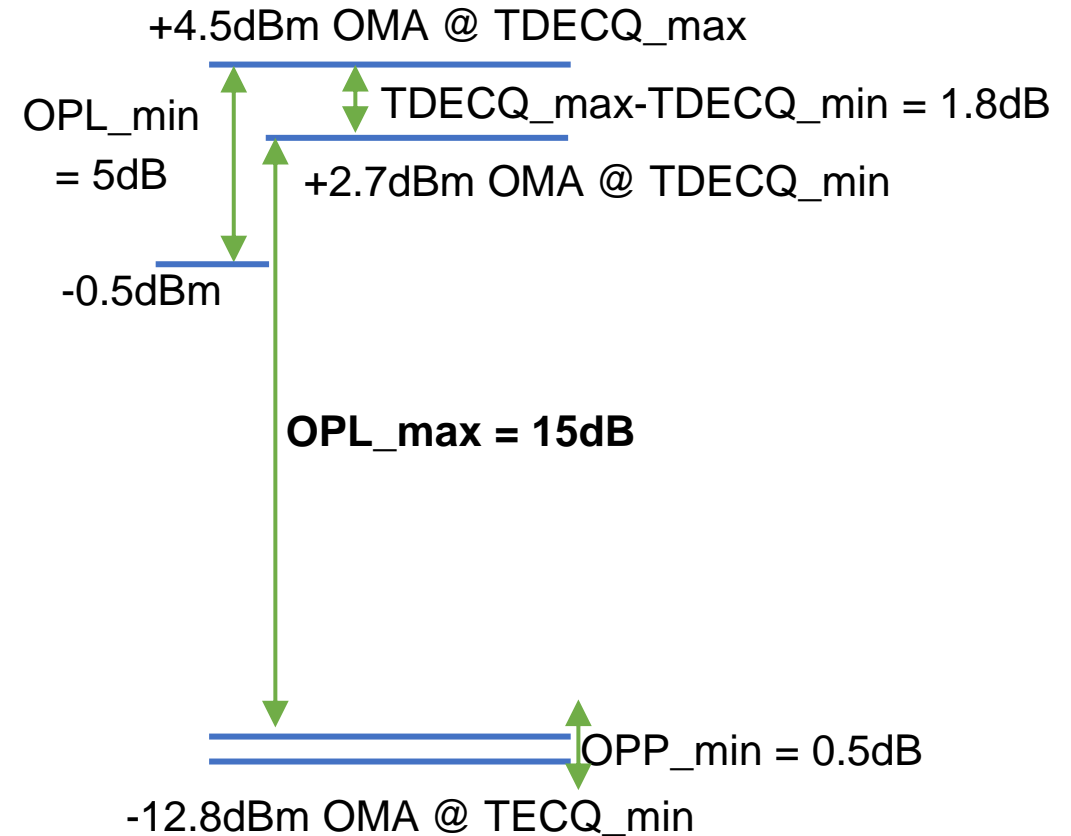
Items	Unit	$S_L$ Class Specification	$S_U$ Class Specification
Modulation format		PAM4	PAM4
Nominal modulation rate	Gbit/s	53.125	53.125
Wavelengths	nm	1304.6 $\pm$ 1 nm, 1309.1 $\pm$ 1 nm	1304.6 $\pm$ 1 nm, 1309.1 $\pm$ 1 nm
Mean launch power max	dBm	-0.7 + margin (0.5dB?)	4.3 + margin (0.5dB?)
Launch power in OMAouter (min) - For TDECQ < 1.6 dB - For 1.6 dB < TDECQ < 3.4 dB	dBm	-2.3 -3.9 + TDECQ	+2.7 1.1 + TDECQ
Transmitter and dispersion eye closure for PAM4 (TDECQ) max	dB	3.4	3.4
Receiver sensitivity (OMA) - For TECQ < 1.6 dB - For 1.6 dB < TECQ < 3.6 dB	dBm	-12.8 -14.4 + TECQ	-12.8 -14.4 + TECQ
Receiver OMA max		-0.5 + margin (0.5dB?)	-0.5 + margin (0.5dB?)
Damage threshold MAX	dBm	0.5 + margin (0.5dB?)	0.5 + margin (0.5dB?)
TDECQ – TECQ  (max)	dB	2.5	2.5
Optical path penalty MAX (Informative)	dB	2.5	2.5
Extinction ratio MIN (Note 3)	dB	5.0	5.0
Bit error ratio		Less than $2.4 \times 10^{-4}$	Less than $2.4 \times 10^{-4}$

# Power budgets

## $S_L$ Class



## $S_U$ Class



# 100G BiDi PtP adhoc group -time plan-

Ad hoc meeting is held once a month at 14:00- 15:00 CEST (Geneva Time).

7<sup>th</sup> : 2023.3.2 (Thu.)

8<sup>th</sup> : 2023.4.13 (Thu.)

9<sup>th</sup> : 2023.5.11 (Thu.)

Now



	Oct.	Nov.	Dec.	Jan. 2023	Feb.	Mar.	Apr.	May
ITU-T	▲ ITU interim 10/25-27	▲ ITU interim 11/29-12/1	▲ ITU interim 12/6-12/8	▲ ITU interim 1/17-18	▲ ITU interim 2/21-23	▲ ITU interim 3/21-23	▲ ITU Plenary 4/24-27	
IEEE		▲ Plenary 11/14-18		▲ Interim 1/16		▲ Plenary 2 <sup>nd</sup> week in Mar.		▲ Interim 2 <sup>nd</sup> week in May
100G Bidi adhoc	▲ 2nd 10/13	▲ 3rd 11/22	▲ 4th 12/9	▲ 5th 1/12	▲ 6th 2/9	▲ 7th 3/2	▲ 8th 4/13	▲ 9th 5/11

# Summary

- ITU-T G.9806Am3 project are developing specifications based on technologies well-supported by industry
- Specification alignment between ITU-T and IEEE is essential for the ecosystem
- Class S in G.9806Am3 target consent in the April 2023 ITU-T SG15 Plenary  
The adhoc group must conclude its work and **reach consensus by 17 March**
- Requests to IEEE 802.3 participants
  - Feedback of strawman PMD parameters to the ITU-T 100G BiDi PtP adhoc group
  - IEEE 802.3 participants are encouraged to join the ITU-T 100G BiDi PtP adhoc group.  
Contact to its co-chairs;  
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THANK YOU