



# ITU-T G.9806AM3 UPDATE

IEEE 802.3 WORKING GROUP

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

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JUN SHAN WEY, VERIZON, USA

HIROTAKA NAKAMURA, NTT, JAPAN

DEREK NESSET, HUAWEI, GERMANY

JOHN JOHNSON, BROADCOM, USA

TAKUYA KANAI, NTT, JAPAN

FABRICE BOURGART, ORANGE, FRANCE

# Background

- 100G-BiDi ad hoc group formed for G.9806Am3 is progressing discussion
  - Monthly meeting
  - Target time of consent of class S(0-15 dB) is the next ITU-T SG15 plenary on April 2023
  - Target time of consent of class B-(0-23 dB) is ITU-T SG15 plenary on November 2023
- This contribution shares strawman PMD parameters agreed by 100G-BiDi ad hoc meeting
  - Wavelength, transmitter launch power, receiver sensitivity, TDECQ, TECQ
  - Line code, FEC, S/X, Pulse mask, test pattern

# Strawman PMD parameters for G.9806Am3

Items	Unit	Specification	Reference
Modulation format		PAM4	"ITU-T G.9806AM3 UPDATE", Joint, IEEE plenary meeting, Jan. 2023.
Nominal modulation rate	Gbit/s	53.125	"ITU-T G.9806AM3 UPDATE", Joint, IEEE plenary meeting, Jan. 2023.
Wavelengths	nm	1304.6 ±1 nm, 1309.1 ±1 nm	"ITU-T G.9806AM3 UPDATE", Joint, IEEE plenary meeting, Jan. 2023.
Mean launch power MAX	dBm (AVP)	TBD	+3.6 dBm for 50G-BiDi in "G.9806 Corr.1"
Launch power in OMAouter (min) - For TDECQ < 1.6 dB - For 1.6 dB < TDECQ < 3.6 dB	dBm	+3.0 +3.0 + TDECQ	"20230209_011_contribution_NTT" and "20230209_012_contribution_Huawei" in 6 <sup>th</sup> 100G-BiDi ad hoc meeting, Feb. 2023.
Launch power in OMAouter minus TDECQ (min)	dBm	1.4	"20230209_011_contribution_NTT" and "20230209_012_contribution_Huawei" in 6 <sup>th</sup> 100G-BiDi ad hoc meeting, Feb. 2023. * subject to minimum TDECQ of 1.6dB
Transmitter and dispersion eye closure for PAM4 (TDECQ) MAX	dB	3.6	+3.2 dB for 50G-BiDi in "G.9806 Corr.1"
Receiver sensitivity (OMA) - For TECQ < 1.6 dB - For 1.6 dB < TECQ < 3.6 dB	dBm	-12.5 -12.5 + TECQ	"20230209_011_contribution_NTT" and "20230209_012_contribution_Huawei" in 6 <sup>th</sup> 100G-BiDi ad hoc meeting, Feb. 2023.
Damage threshold MAX	dBm	TBD	
TDECQ – TECQ  (max)	dB	2.5	"20230209_011_contribution_NTT" and "20230209_012_contribution_Huawei" in 6 <sup>th</sup> 100G-BiDi ad hoc meeting, Feb. 2023.
Optical path penalty MAX (Informative)	dB	2.5	"20230209_011_contribution_NTT" and "20230209_012_contribution_Huawei" in 6 <sup>th</sup> 100G-BiDi ad hoc meeting, Feb. 2023.
Extinction ratio MIN (Note 3)	dB	5.0	"ITU-T G.9806AM3 UPDATE", Joint, IEEE plenary meeting, Jan. 2023.
Bit error ratio		Less than 2.4 x 10 <sup>-4</sup>	Specification of 50G-BiDi in "G.9806 Corr.1"

# Strawman PMD parameters for G.9806Am3

Coding: 64B66B, IEEE 802.3-2022 Clause 140.1.1

FEC: RS(544,514), IEEE 802.3-2022 Clause 140.1.1

Pulse mask: Not apply to 100 Gbit/s

S/X: follow 50Gb/s specification(G.9806 amd.2)

Test pattern: IEEE 802.3-2022 Clause 140.7.1

# Open topics under discussion for class B-

- Strawman PMD parameters for class B-
- Impacts of fiber non-linearity (based on VPI simulations):
  - SPM in the fiber has a significant impact on the 40km 100G PAM4 link performance
  - High TDECQ values induced by high launch OMA. Especially raised cosine shaped signals from transmitter can have high TDECQ values (e.g. 16dB)
  - CD limits: Can a statistical CD value be used as each link typically consists of multiple independent fiber spans? Operators' inputs needed.
  - Impact from SBS needs to be studied
  - Evaluation of simulation results by using commercially available components is needed
- For Class B-, further study to compare the pros and cons between 1x100G vs 2x50G is needed
  - Size(form factor), power consumption, cost(components, implementation)

# 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 March 9
- Requests to IEEE 802.3 participants
  - Feedback of strawman PMD parameters to the ITU-T 100G BiDi PtP adhoc group
  - Inputs of open topics from IEEE members will be appreciated
  - IEEE 802.3 participants are encouraged to join the ITU-T 100G BiDi PtP adhoc group.  
Contact to its co-chairs;  
Dr. Hirotaka Nakamura [hirotaka.nakamura.by@hco.ntt.co.jp](mailto:hirotaka.nakamura.by@hco.ntt.co.jp)  
Dr. Derek Nessel [derek.nessel@huawei.com](mailto:derek.nessel@huawei.com)

# Straw Poll #

- I support the specification of 100G PAM4 modulation format using wavelengths  $1304.6 \pm 1\text{nm}$  and  $1309.1 \pm 1\text{nm}$  for the 100G BiDi 10km and 20km PMD objectives.
  - Yes:
  - No:
  - Need more information:





THANK YOU