

# PMD parameters of 40-km specification (BR40) Part2

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# Introduction

1. At the December meeting, we proposed and discussed PMD parameters for BR40.
2. In previous proposal, “Average launch power (max)” was TBD. And we got advice to align the description of “Wavelengths.”
3. In this contribution, “Average launch power (max)” and “Wavelengths” are discussed.

# PMD parameters for BR40

Items	Before revision	After revision	Unit
Signalling rate (range)	53.125 ± 100 ppm	53.125 ± 100 ppm	Gbit/s
Modulation format	PAM4	PAM4	-
Downstream center wavelength (range)	1309.1 ± 1 nm	1308.1 to 1310.1	nm
Upstream center wavelength (range)	1304.6 ± 1 nm	1303.6 to 1305.6	nm
Average launch power (max)	TBD	+8.5	dBm
Average launch power (min)	TBD	+2.7	dBm
Outer Optical Modulation Amplitude (OMA <sub>outer</sub> ) (min) For TDECQ < 1.4 dB For 1.4 dB < TDECQ < TDECQ (max)	5.7 4.3 + TDECQ	5.7 4.3 + TDECQ	dBm
Transmitter and dispersion eye closure for PAM4 (TDECQ) max	3.9	3.9	dB
Receiver sensitivity (OMA <sub>outer</sub> ) For TECQ < 1.4 dB For 1.4 dB < TECQ < 3.9 dB	-12.8 -14.2 + TECQ	-12.8 -14.2 + TECQ	dBm
Receiver OMA max	-1.6	-1.6	dBm
Damage threshold MAX	-1.4	-1.4	dB
TDECQ – TECQ  (max)	2.7	2.7	dB
Extinction ratio MIN	5.0	5.0	dB
Bit error ratio	Less than 2.4 x 10 <sup>-4</sup>	Less than 2.4 x 10 <sup>-4</sup>	-

# Summary

- In this contribution, “Average launch power (max)” and “Wavelengths” were discussed.

Thank you

Back Up

# PMD parameters of 40 km specification in ITU-T G.9806

Items	Unit	Class B <sub>L</sub> 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	+9.4
Launch power in OMA <sub>outer</sub> (min) For TDECQ < 1.6 dB For 1.6 dB < TDECQ < 3.7 dB	dBm	+7.0 +5.4 + TDECQ
Transmitter and dispersion eye closure for PAM4 (TDECQ) max	dB	3.7
Receiver sensitivity (OMA) For TECQ < 1.6 dB For 1.6 dB < TECQ < 3.7 dB	dBm	-13.5 -15.1 + TECQ
Receiver OMA max	dBm	0.0
Damage threshold MAX	dB	1.0
TDECQ – TECQ  (max)	dB	2.5
Optical path penalty MAX (Informative)	dB	2.5
Extinction ratio MIN	dB	5.0
Bit error ratio		Less than 2.4 x 10 <sup>-4</sup>



# Average launch power

Items	Unit	Class Specification
Outer Optical Modulation Amplitude ( $OMA_{outer}$ ) (min) For TDECQ < 1.4 dB For 1.4 dB < TDECQ < 3.9 dB	dBm	+5.7 +4.3 + TDECQ
Transmitter and dispersion eye closure for PAM4 (TDECQ) max	dB	3.9

\*Relation between Average Power (AVP) and Optical Modulation Amplitude (OMA) [3]

Referring to Subcause 58.7.6:

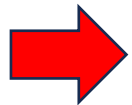
$$OMA = 2P_{mean} \frac{ER-1}{ER+1}, \quad ER = \frac{P_1}{P_0}$$

$$P_{mean} = OMA \frac{ER+1}{2(ER-1)}$$

Outer Optical Modulation Amplitude @TDECQ max : 8.2 dBm in OMA (4.3+3.9)  
Average launch power @Extinction Ratio = 5 dB: 8.0 dBm

The Average launch power max

- Margin of 0.5 dB was added to Average launch power @TDECQ max



The average launch power max for 100G 40-km specification  
8.0 dBm + 0.5 dB = **8.5 dBm**