

PMD parameters of 40-km specification (BR40) Part3

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Introduction

- The PMD parameters was proposed and discussed for BR40 at January interim meeting
- Two comments from participants
 - The average launch power min is too small. It should be defined with the assumed TDECQ min and OMA.
 - Which value, 2.5 or 2.7 dB, should be used for $|TDECQ - TECQ|$ (max)?
- We propose the average launch power min and $|TDECQ - TECQ|$ (max) in this contribution.

Average launch power min

- Calculation approach of average launch power min
 - The average launch power min is determined by OMA, the assumed extinction ratio, and TDECQ(TECQ).
 - Extinction ratio max: infinity
 - TDECQ (TECQ) min: 1.4 dB
 - Average launch power min
 - Extinction ratio max: infinity
 - OMA_{outer}: +5.7 dBm(TDECQ ≤ 1.4 dB)
- Average launch power: +2.7 dBm**
(AVP = OMA – 3.01 dB @ Extinction ratio = ∞)

*Relation between Average Power (AVP) and Optical Modulation Amplitude (OMA) [1]

Referring to Subclause 58.7.6:

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

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

[1] https://www.ieee802.org/3/av/public/2008_05/3av_0805_lin_2.pdf

$|TDECQ - TECQ|$ (max)

- TDECQ max is specified, but TECQ min is not specified.
OMA_{outer} and receiver sensitivity are constant below 1.4 dB.
→ $|TDECQ - TECQ|$ (max) \neq $|3.9 - 1.4|$ (dB)
- We propose 2.7 dB for $|TDECQ - TECQ|$ (max) , because this value has been discussed and decided in 100G lambda MSA.

Proposal

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

*informative

Thank you