

# **100GBASE-ER4-lite PMD Considerations**

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40Gb/s and 100Gb/s Fiber Optic Task Force  
SMF Ad-Hoc  
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# Background

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- HSSG identified the need for 40km interface, for example:  
[http://www.ieee802.org/3/hssg/public/nov06/goergen\\_02\\_1106.pdf](http://www.ieee802.org/3/hssg/public/nov06/goergen_02_1106.pdf)
- 802.3ba Task Force wrote a 100GbE-ER4 specification based on the available technology: EML TX & SOA RX (at the time there was no 25G APD technology)
- 25G APD technology is now available, marginally meeting the 100GbE-ER4 RX Sens.
- There has been off-line discussion to relax the ER4 power budget and RX Sens., for example by 3dB, to make 25G APD implementations practical
- 25G APD enables ER4 in a small form factor, for example CFP4, by eliminating the thermal load of the SOA
- 25G APD enables low extinction ratio and lower cost TX, for example DFB laser based

# Objectives

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- Determine level of interest among SMF Ad Hoc participants in an ER4-lite specification that enables use of low power 25G APD RX and lower cost TX technologies
  - Determine level of interest in standardizing ER4-lite specification in 802.3bm
    - requires modification to the Distinct Identity 5 Criteria response to fit within the project documentation
  - Determine level of consensus for an ER4-lite spec.
    - Discuss ER4-lite specification alternatives
    - two examples are on the next page
    - there are others
- If there is strong SMF Ad Hoc interest and consensus, prepare a proposal presentation for the May 802.3 Interim to determine level of interest and consensus among 802.3bm Task Force participants

# 100GbE-ER4-lite Specification Alternatives

100GBASE-Standard	LR4 10km	ER4 40km (Eng)	ER4-lite Alt. 1 30km	ER4-lite Alt. 2 30km (Eng)
TX OMA (min) dBm	-1.3 (at 1dB TDP)	0.1	-1.3 (at 1dB TDP)	-1.3 (at 1dB TDP)
TX ER (min) dB	4	8	4	4
SRS OMA (max) dBm	-6.8	-17.9	<b>-13.8</b>	<b>-13.3</b>
RX Sens OMA (info max) dBm	-8.6	-21.4	<b>-17.3</b>	<b>-16.3</b>
Power Budget (info) dB	8.5 (at max TDP)	21.5	<b>18.5</b>	<b>17</b>
Penalties (info) dB	2.2 (at max TDP)	3.5	<b>3.5</b>	<b>3.0</b>
Loss Budget (info) dB	6.3	18    15 40km 30km	<b>15</b>	<b>14    14</b> <b>30km 28km</b>