In support of comment I-95 to change average launch power max

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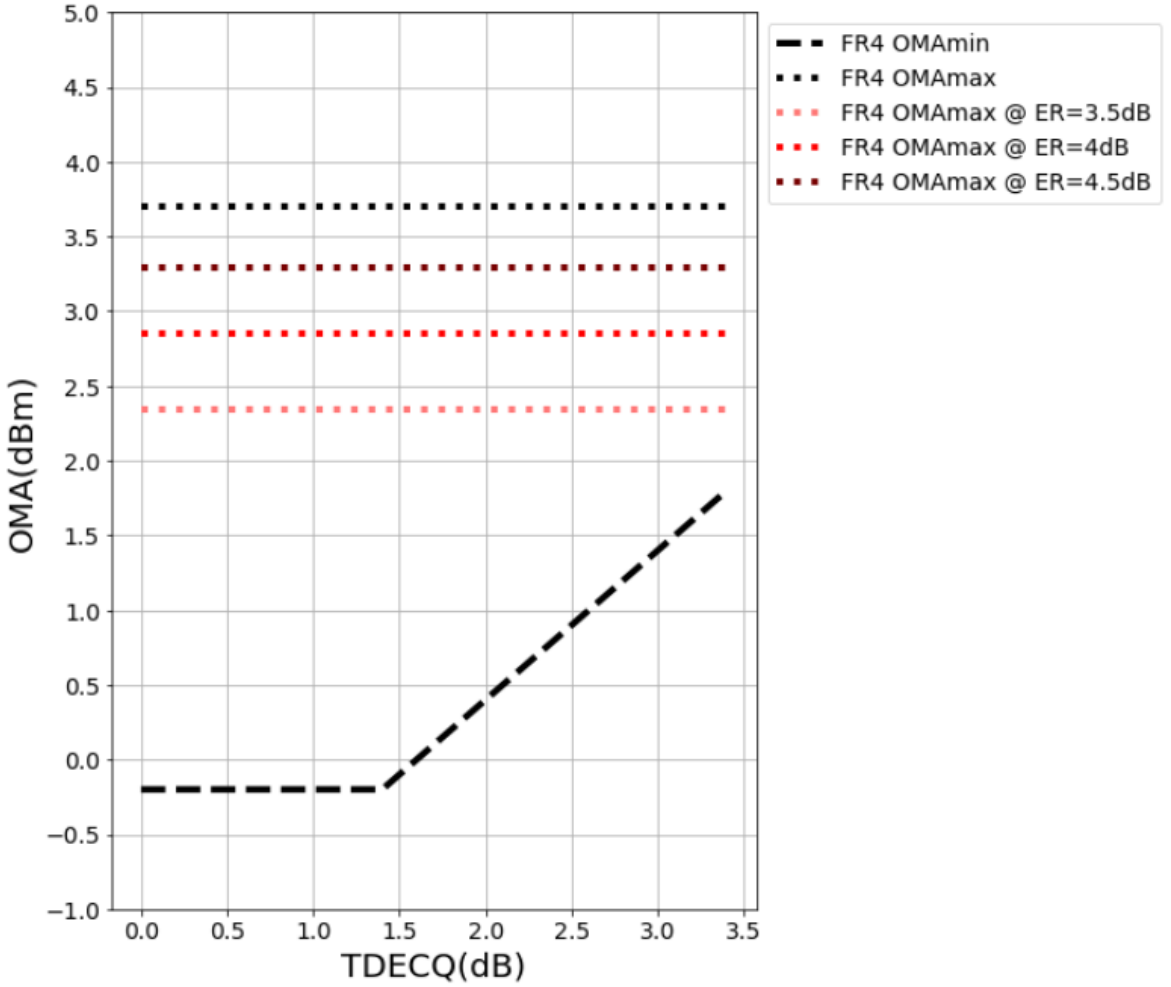
September 22nd, 2020

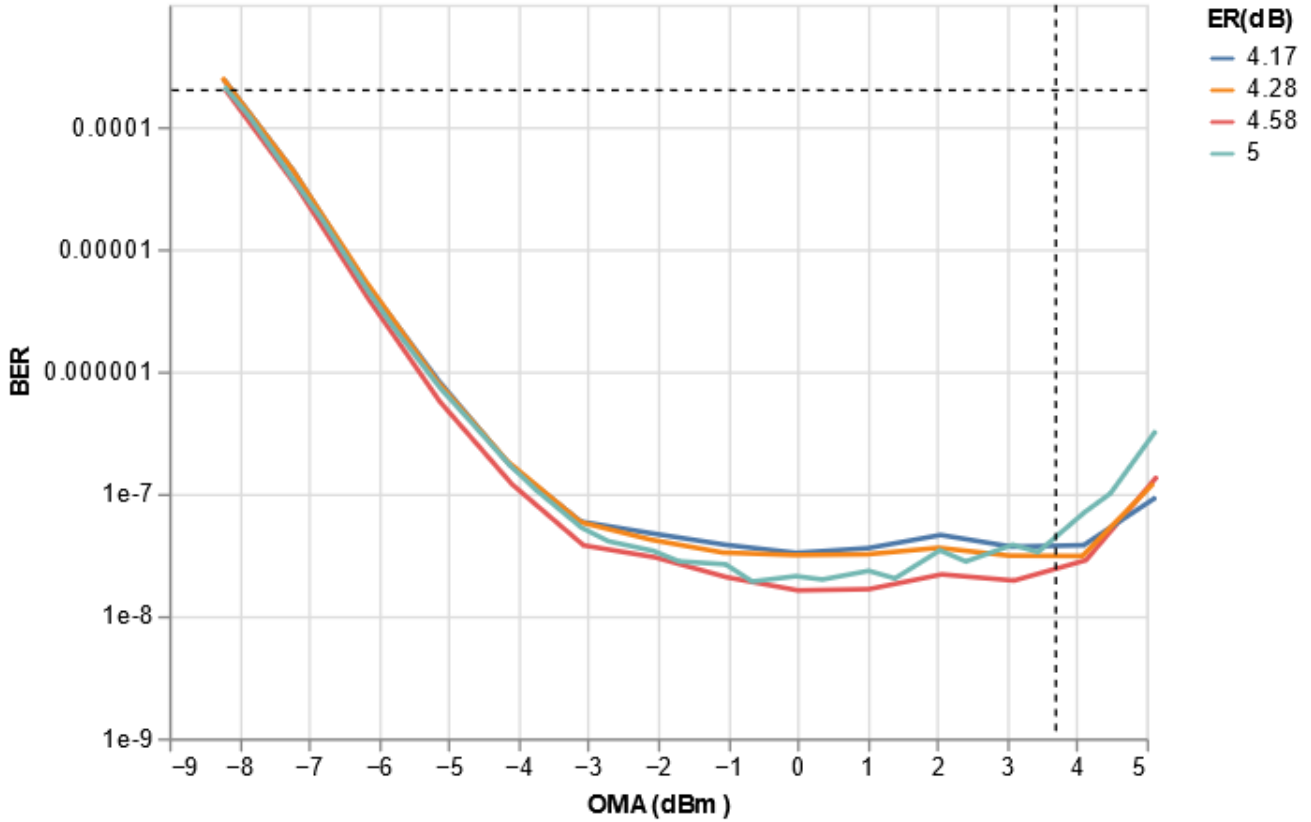
Problem with current spec:

- FR4 and LR4-6 spec on 'Average launch power, each lane (max)' constrains effective Tx OMA range
- At max TDECQ, OMA range reduces from 1.9dB to 1dB @ ER= 4dB.
- It makes reducing ER below 5.1dB not an option to meet Tx spec on high power lanes
  - Uniformity in average power across 4 lanes is difficult
  - Receiver overload is affected by max OMA, not AOP
  - We should allow lanes with high AOP to reduce ER at least to 4dB to pass max OMA spec
  - Even more important to enable uncooled operation
- Same technology receivers on FR1 and LR1 already have AOP max 0.5dB higher than current FR4 and LR4-6 spec <u>without demux</u>



FR4 Receiver Performance vs ER

- Measuring waterfall on same receiver and transmitter adjusting Tx swing to vary ER.
- Lowest ER line has 0.68dB higher AOP than the highest ER at the same OMA
- Higher AOP on the lowest ER does not trigger overshoot at lower OMA
- Receiver overload is affected by OMA, not AOP



Summary and recommendation

- We recommend increasing Average launch power max spec to 0.7 dB higher than Outer Optical Modulation Amplitude max spec:
  - 4.4dB for FR4 and 5.1dB on LR4-6

- This change:
  - Allows transmitter to meet OMA max spec by lowering the ER up to 4 dB
  - Allows full Tx OMA range with ER > 4dB
  - Does not affect Receiver overload
  - Aligns power levels on IEEE LR4-6 with LR4 in 100G Lambda MSA
  - Reduces cost by enabling uncooled, high-yield PMD implementation