

Supporting information for comments on transmitter power excursion

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Supporting material for D3.1 comments #83, 84, 85-88

Supporters

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Background

- At the May'26 meeting, the CRG agreed to change the definition and specifications for TX overshoot and undershoot in D3.1:
 - P_{max} and P_{min} are measured at a hit ratio of 10^{-4} rather than 10^{-2} .
 - Maximum TX overshoot and undershoot is 27% rather than 22%.
 - See [rodes 3dj 01b 2605](#) for details.
- TX power excursion (TPE) depends on the definition of overshoot (OS) and needs to be updated to match the new specs.
 - $TPE = \text{Max}(P_{max} - P_{avg}, P_{avg} - P_{min}) = P_3 + OS * OMA - P_{avg} \sim OMA * (OS + \frac{1}{2})$ assuming linearity of the optical signal.
 - At a fixed value of TPE, the allowable maximum OS is reduced for high OMA, as shown previously in [rodes 3cu 01a 110920](#).
 - In previous drafts OS at OMA(max) was agreed to be 14.6% (at 10^{-2}).
 - See [johnson 3dj 01a 2411](#) for details.

Current OS and TPE specs using 10^{-2} hit ratio

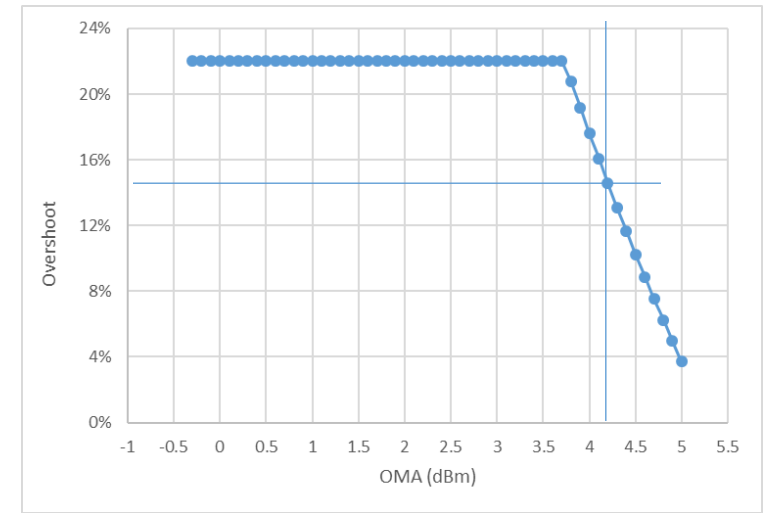
PMD	OMA_max (dBm)	Pavg_max (dBm)	OS_max	TPE_max (dBm)	Max OMA @ TPE_max (dBm)	OS @ OMA_max
800G-DR4	4.2	4	22%	2.3	3.73	14.6%
800G-FR4-500	4.8	4.9	22%	2.9	4.33	14.6%
800G-DR4-2	4.2	4	22%	2.3	3.73	14.6%
800G-FR4	4.8	4.9	22%	2.9	4.33	14.6%
800G-LR4	5.7	5.5	22%	3.8	5.23	14.6%

OS vs. OMA for 800G-DR4:

OS(max) = 22%

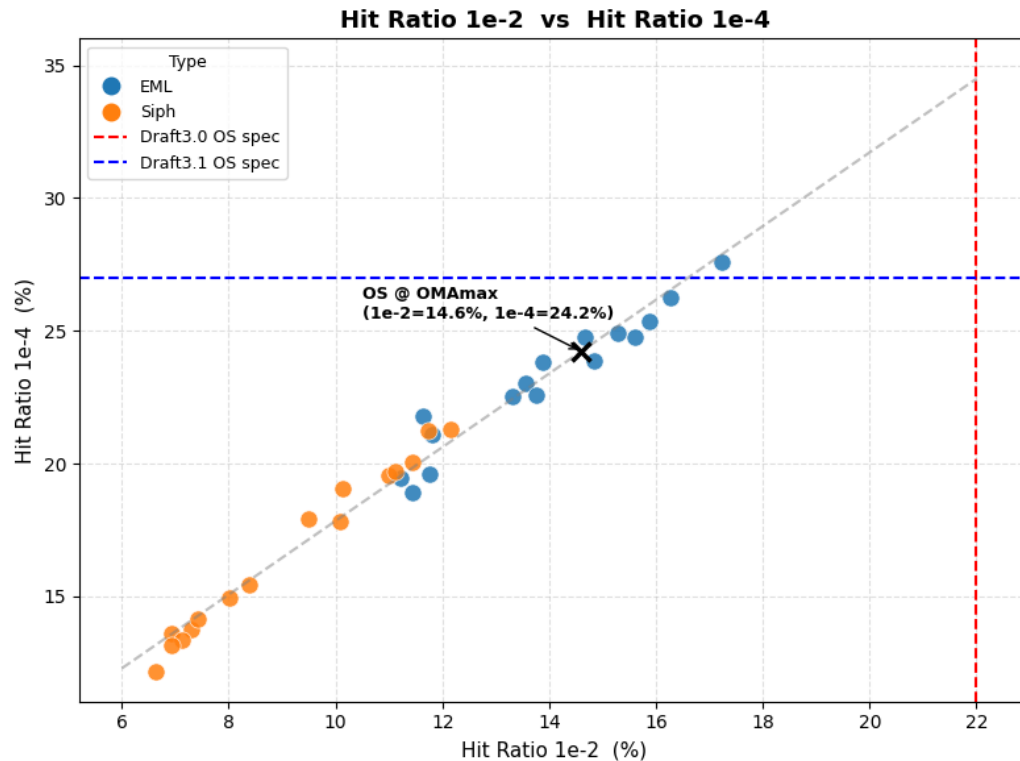
TPE(max) = 2.3 dBm

OS = 14.6% at OMA(max) = 4.2 dBm



See [johnson_3dj_01a_2411](#) for details.

Comments #85-88: Proposed maximum TPE specs at 10^{-4} hit ratio



- Based on the TX overshoot data shown in [rodes 3dj 01b 2605](#), a value of 14.6% OS at OMA(max) at 10^{-2} hit ratio is equivalent to a value of 24.2% at 10^{-4} hit ratio.
- Using the value of 24.2% at OMA(max) results in the TPE values for 3dj optical PMDs shown below in red.

PMD	OMA_max (dBm)	Pavg_max (dBm)	OS_max	TPE_max (dBm)	Max OMA @ TPE_max (dBm)	OS @ OMA_max
800G-DR4	4.2	4	27%	2.90	4.04	24.2%
800G-FR4-500	4.8	4.9	27%	3.50	4.64	24.2%
800G-DR4-2	4.2	4	27%	2.90	4.04	24.2%
800G-FR4	4.8	4.9	27%	3.50	4.64	24.2%
800G-LR4	5.7	5.5	27%	4.40	5.54	24.2%

Fix the TX overshoot and undershoot test methods to use 3dj OMA_{outer} test methods

Current text in D3.1 180.9.9, 181.9.9, 182.9.9 and 183.9.9

- Transmitter overshoot and undershoot are calculated using the methods in 140.7.7, with the exception that the hit ratio used to determine P_{max} and P_{min} is 1×10^{-4} .
- Note that 140.7.7 refers back to the OMA_{outer} test method in 122.8.4 for P_0 , P_3 and OMA_{outer}

Comment #83: Proposed text for 180.9.9, 181.9.9, 182.9.9 and 183.9.9

- Transmitter overshoot and undershoot are calculated using the methods in 140.7.7, with the exceptions that P_0 , P_3 and OMA_{outer} are measured using the methods in 180.9.5 and the hit ratio used to determine P_{max} and P_{min} is 1×10^{-4} .

Fix the TX power excursion test methods to use 10^{-4} hit ratio

Current text in D3.1 180.9.10, 181.9.10, 182.9.10 and 183.9.10

- Transmitter power excursion is defined in 140.7.8.

Comment #84: Proposed text for 180.9.10, 181.9.10, 182.9.10 and 183.9.10

- Transmitter power excursion is defined in 140.7.8, with the exception that the hit ratio used to determine $P_{\max}$ and $P_{\min}$ is 1×10^{-4} .

Thank You