

100G SR4: Normalizing TxVEC+

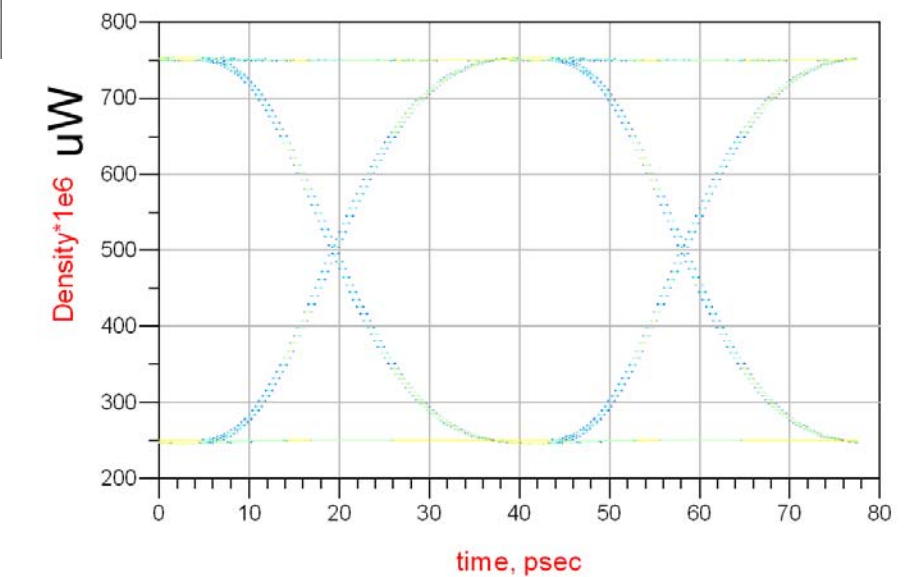
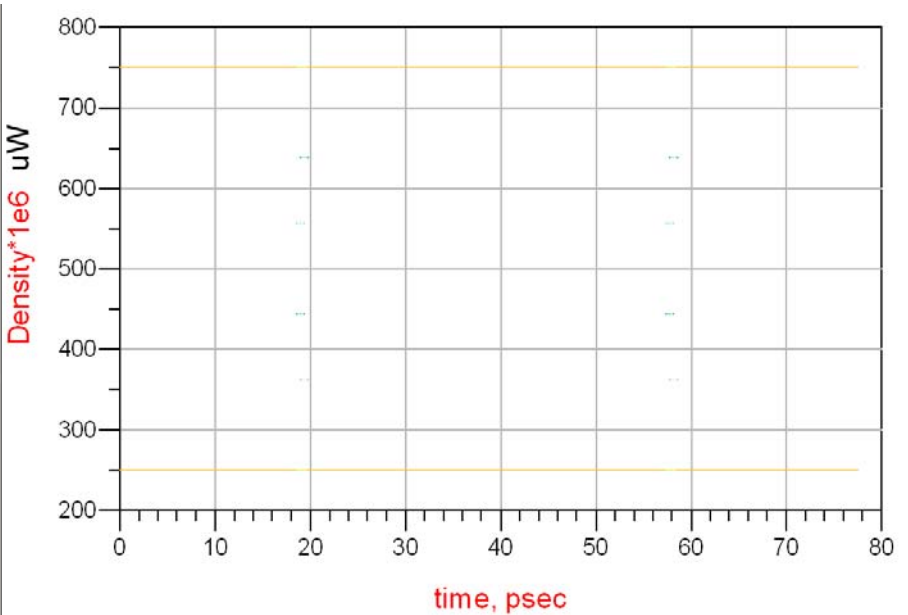
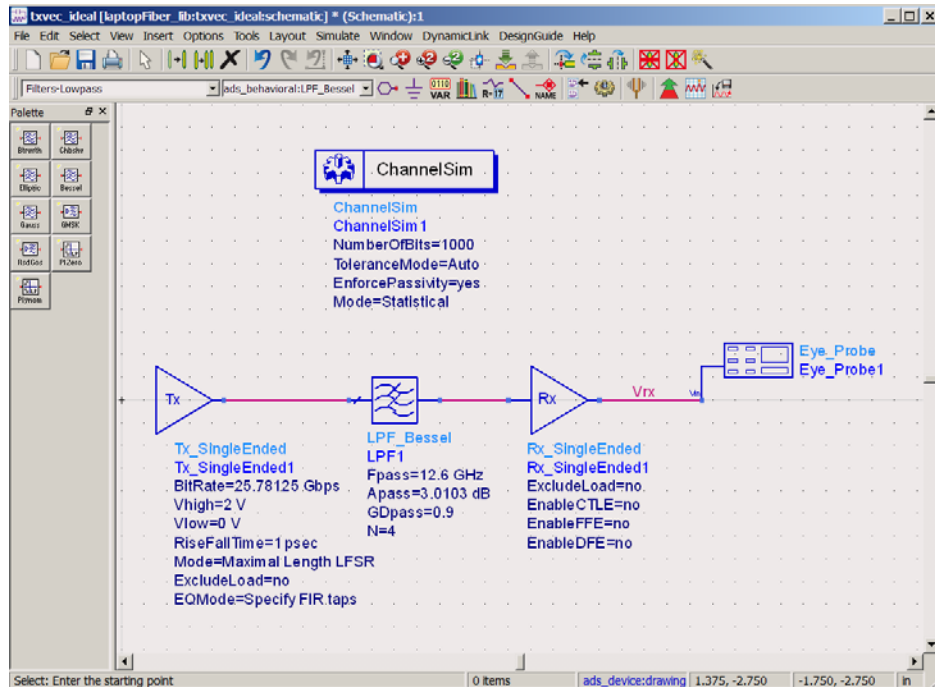
John Petrilla: Avago Technologies

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Presentation Summary

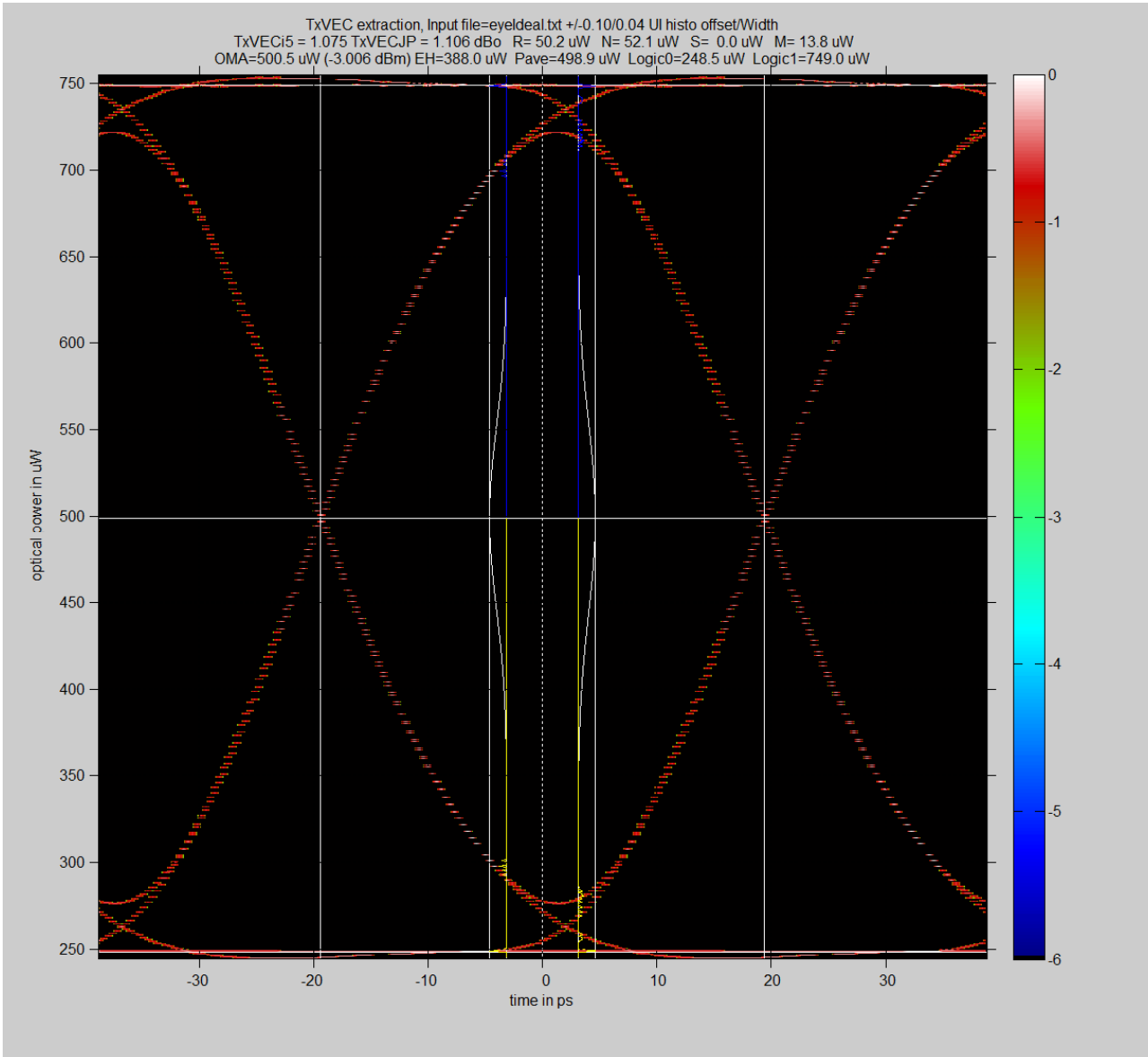
- In the July 2014 meeting, the enhanced TxVEC (hereafter TxVEC+) metric was adopted as the global Tx signal quality metric for draft 3.1.
- This presentation reports on an effort begun to normalize measurements from the TxVEC+ method to align with link margin in order to enable a one-to-one trade-off with Tx OMA.
- The first step is to establish expected TxVEC+ measurement results for an idealized Tx.
 - Should the idealized Tx include the means to equalize the loss of the 12.6 MHz TxVEC filter?
- Next steps include adding noise to the receiver to confirm expected results.

Normalizing TxVEC+: Block Diagram & Waveforms



- The chart on the left shows the simulation block diagram.
- An idealized Tx (top right chart) is used: 1ps transition times, no overshoot, no noise, 1 fUI RJrms. Such a Tx would yield 5 dB link margin according to the spreadsheet link model.
- An idealized scope is used: infinite BW and sensitivity, i.e. noiseless.
- The lower right chart shows the eye after a 19.3 GHz filter. On the following page the eye after the 12.6 GHz TxVEC filter is shown.

Normalizing TxVEC+: Expected result for idealized Tx



- The chart on the left shows the eye as if observed with a 12.6 GHz optical plug-in with a noiseless scope.
- Simulated raw measurement results are provided for both the simplified TxVEC result (1.106 dB) and the enhanced i.e. TxVEC+ result (1.075 dB).
- After using the normalization calculation defined in `petrilla_02_0714_optx`, for TxVEC = Normalized TxVEC = $0.723 \times (\text{TxVEC result} - 1.13 \text{ dB})$, the normalized test result is -0.017 dB , essentially zero for an idealized Tx.
- If the normalization equation for TxVEC+ is similar to that for TxVEC, then the offset term for TxVEC+ should be close to 1.075 dB. Additional data is needed to determine the scale factor as well as to confirm the results.
- The case of a non-ideal Tx, e.g. one with overshoot (pre-emphasis), that can equalize the ISI from the 12.6 GHz TxVEC filter should be considered.