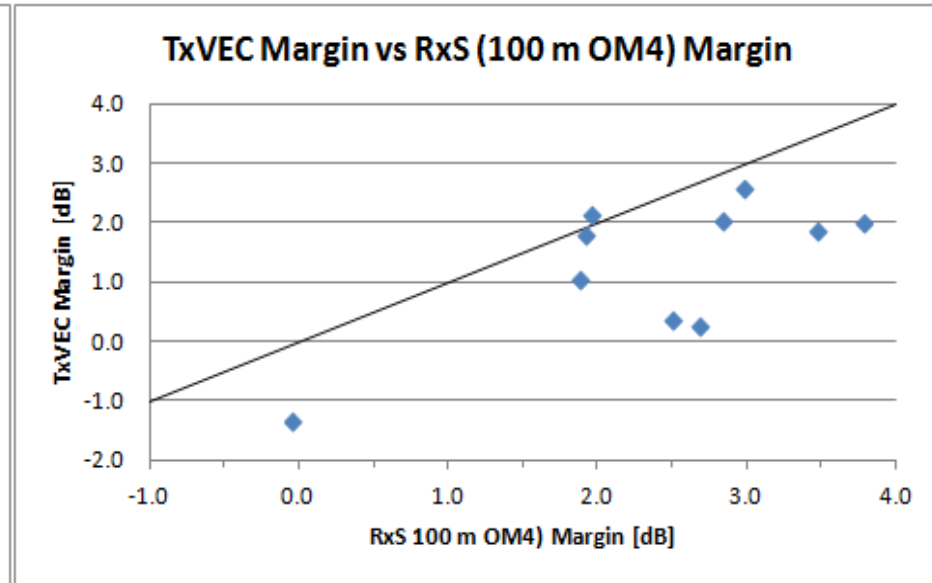
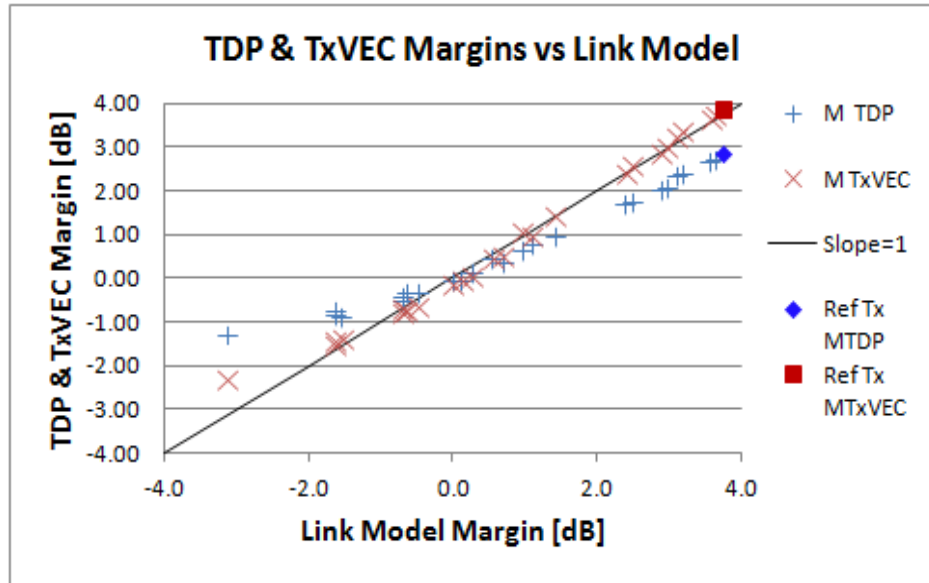


100G SR4 TxVEC Update

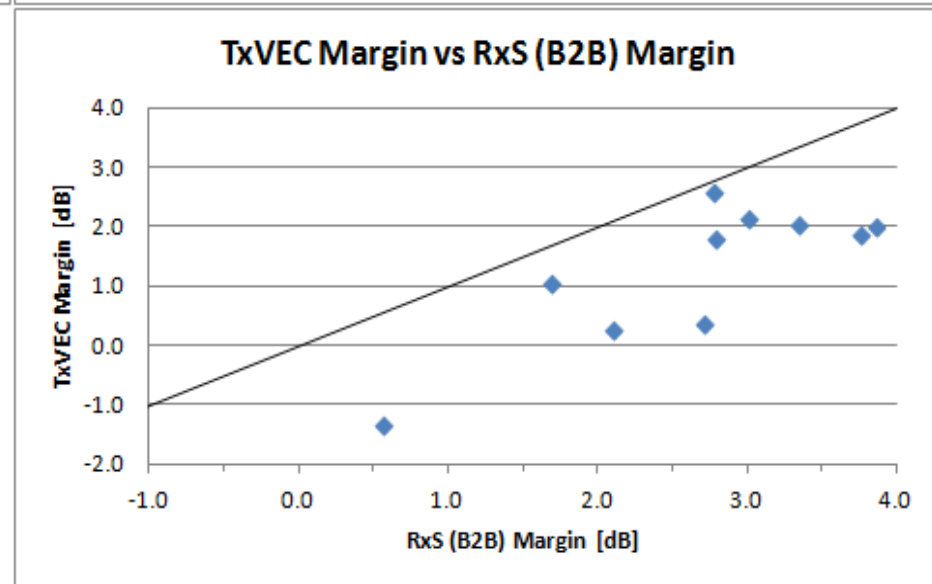
John Petrilla: Avago Technologies

May 2014

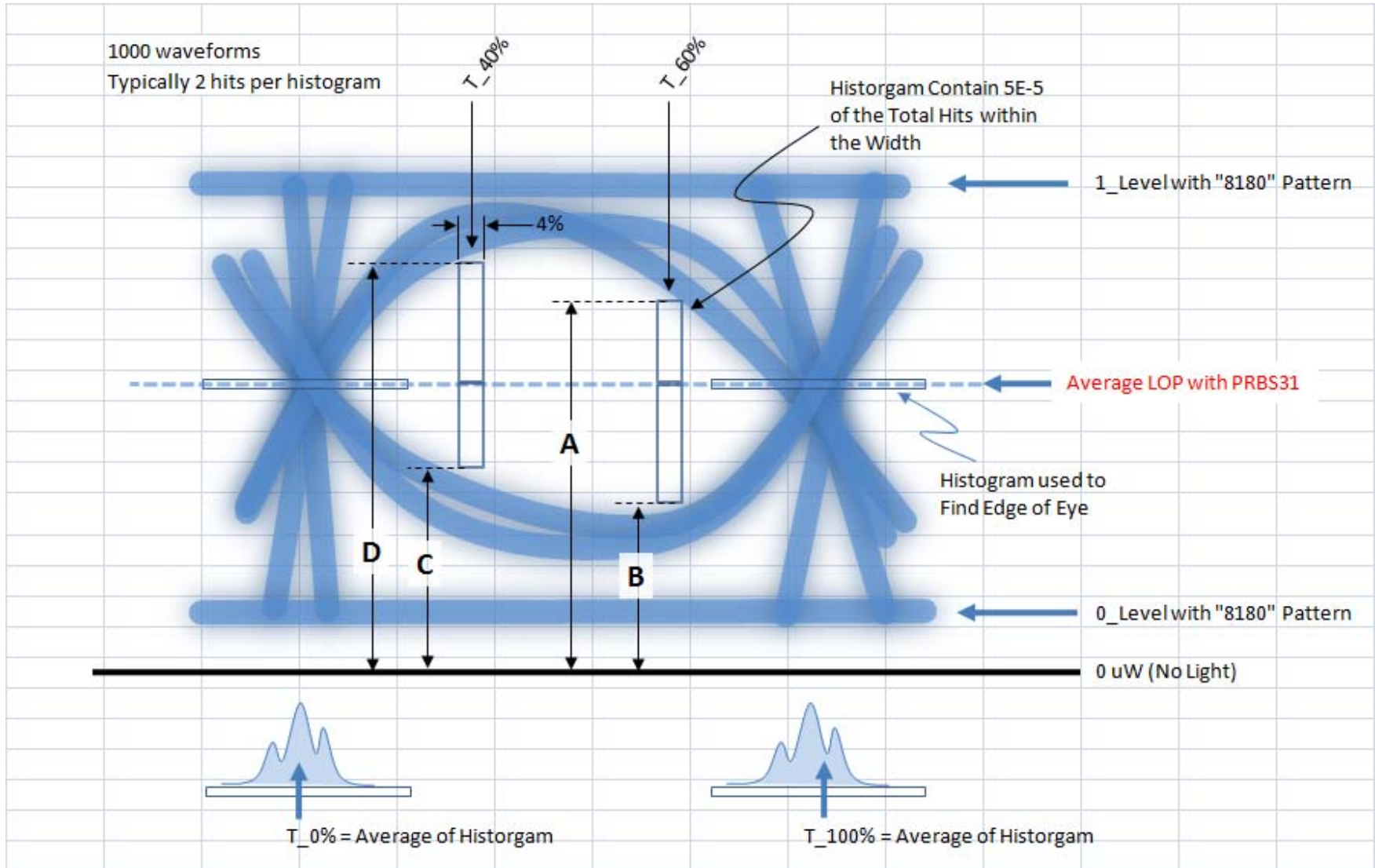
100G SR4 TxVEC Experimental Results



- An experiment was set-up at Avago Technologies to measure TxVEC on a set of 25G transmitters (Tx) and compare the results with the results of receiver sensitivity, RxS, measurements made using the same Tx set.
- The above left chart from prior presentations, shows the expected correlations to link margin for the metrics TDP and TxVEC.
- The charts to the right show correlations of empirical results for TxVEC with RxS margin for cases of minimum reach (B2B) of fiber and a worst case 100 m OM4 fiber.
- RxS margin is used as an analogue for link margin.

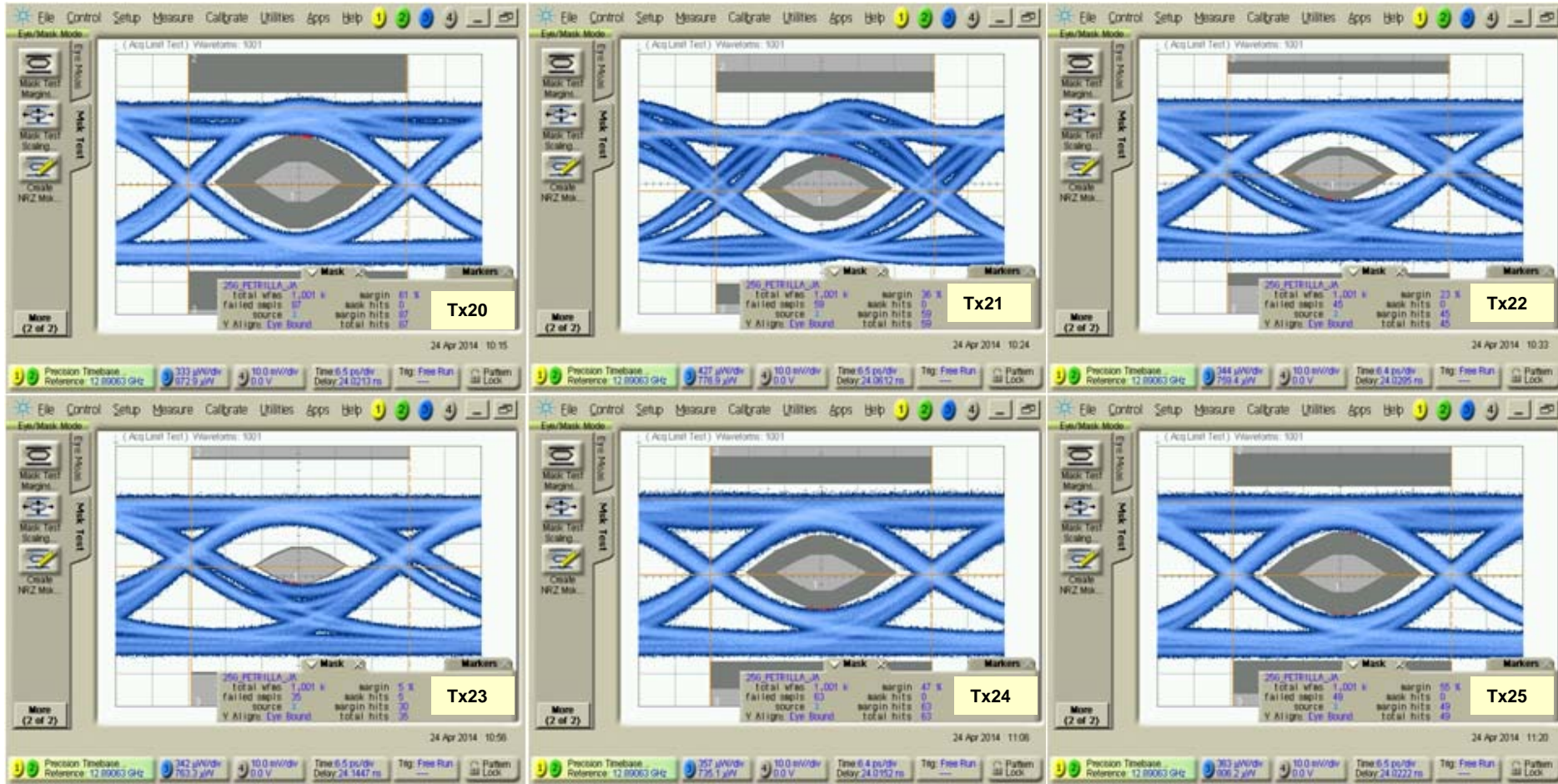


100G SR4 TxVEC Definitions



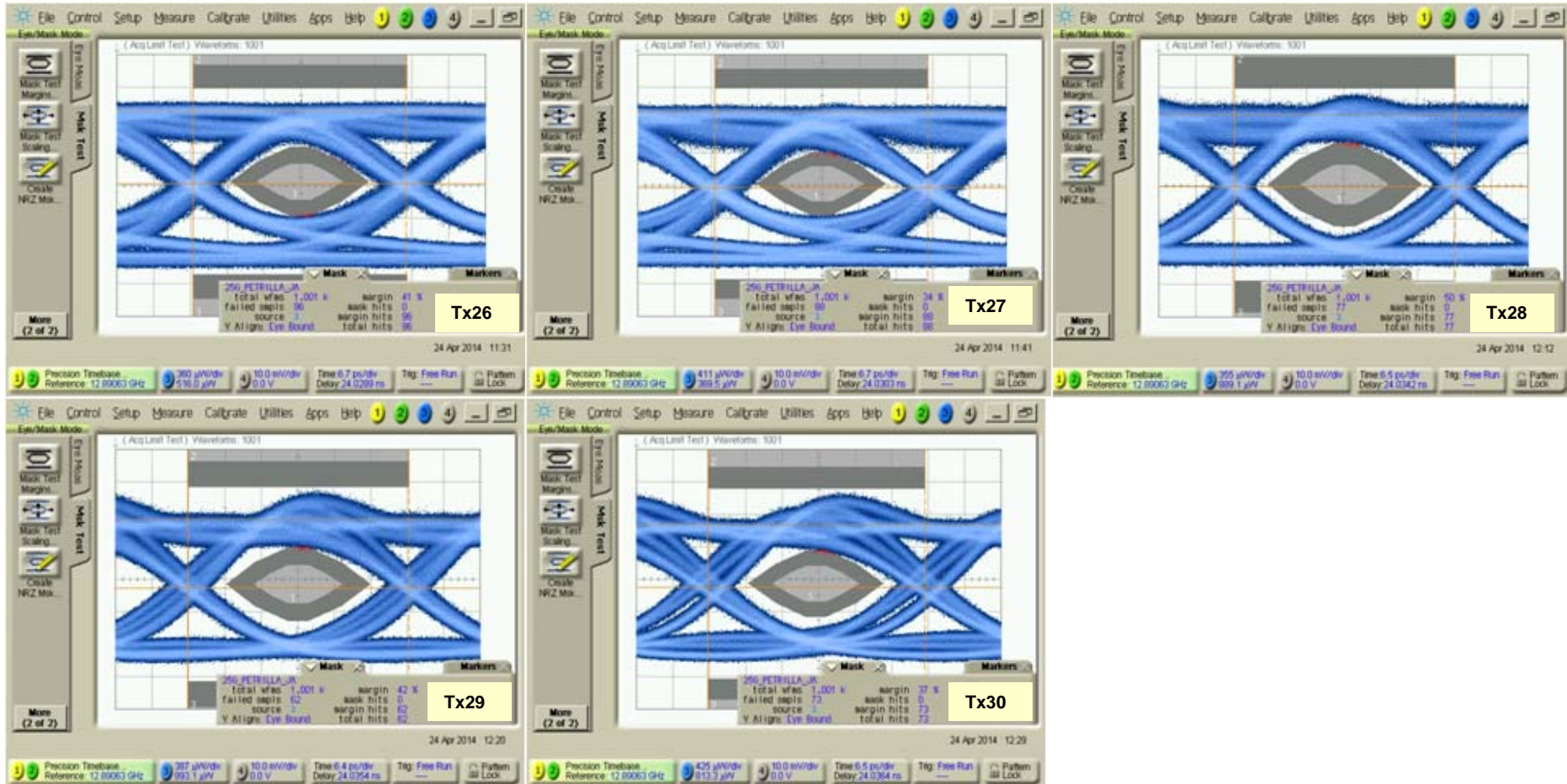
The above image shows the definitions use in the experiment.

Tx Output Eyes for Experimental Tx Set (1 of 2)



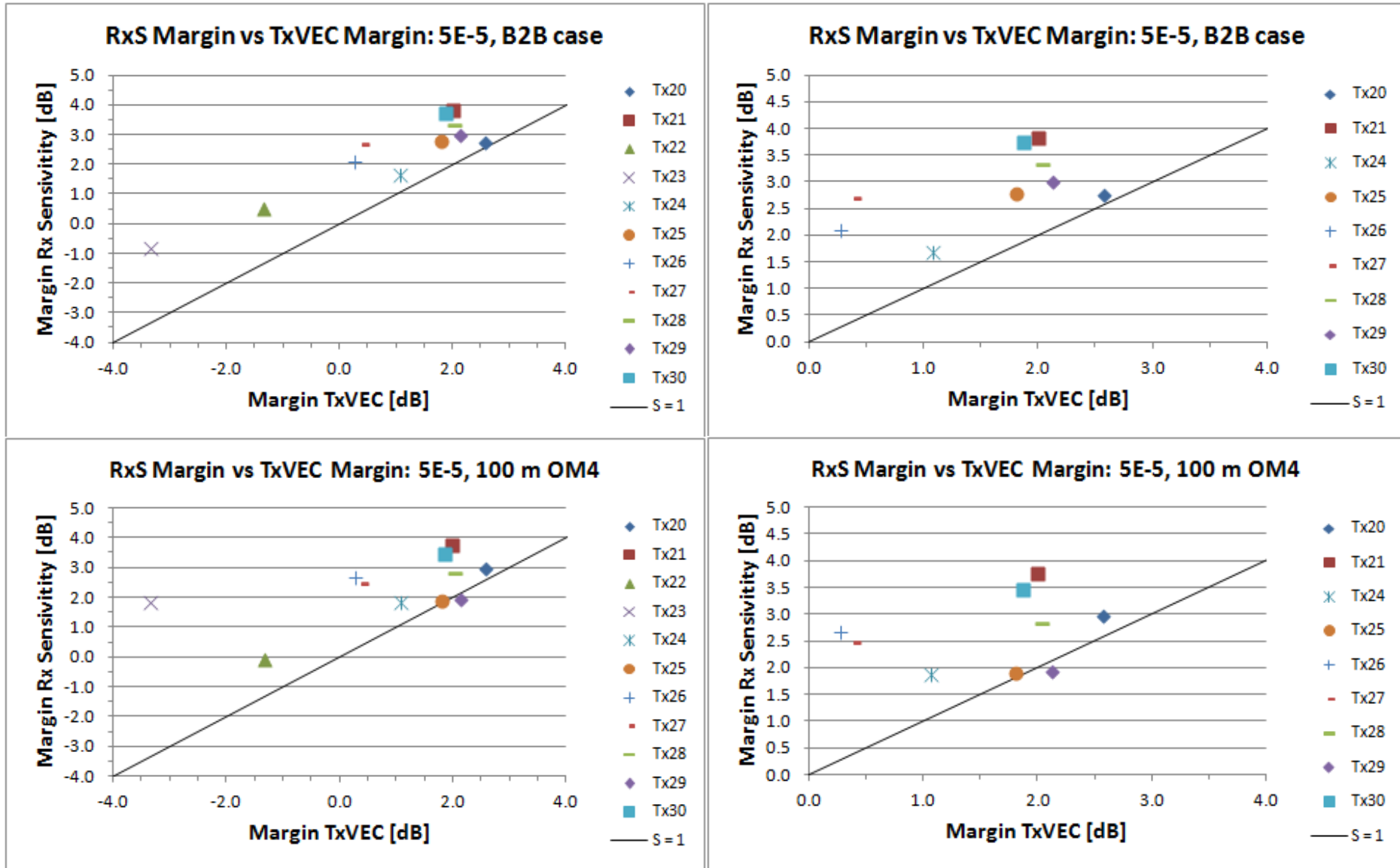
- Eyes using 25GbE optical plug-in are shown above for six of the experimental transmitters.
- The 802.3bm D2.2 CI 95 eye mask is included to help judge eye quality.
- Drive conditions for the transmitters were tuned to for certain eye characteristics and the eyes are not representative of normal devices.

Tx Output Eyes for Experimental Tx Set (2 of 2)



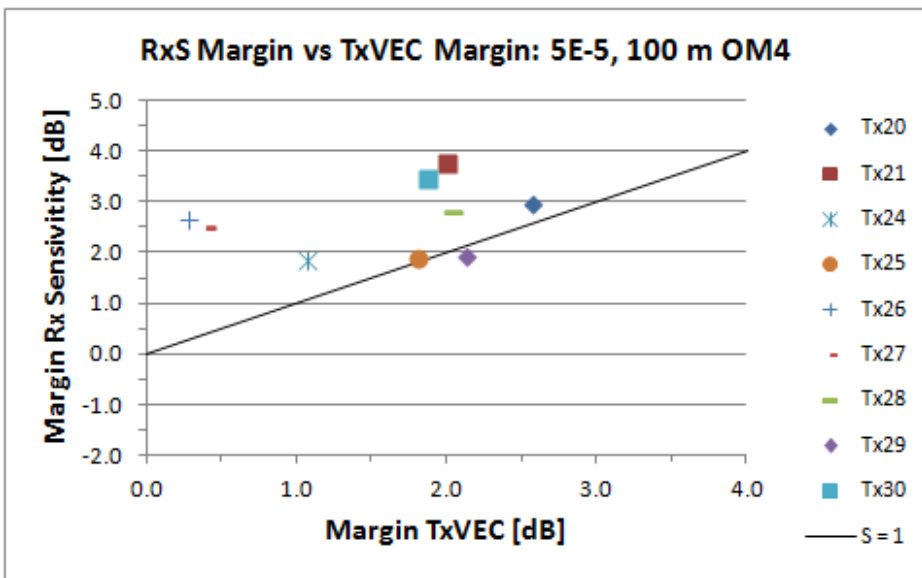
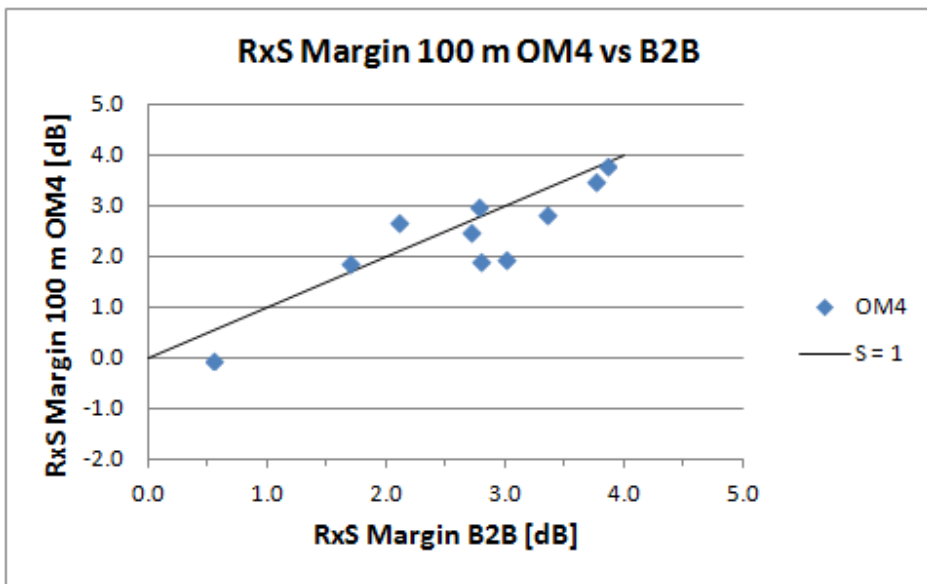
- Eyes using 25GbE optical plug-in are shown above for five of the experimental transmitters.
- The 802.3bm D2.2 CI 95 eye mask is included to help judge eye quality.
- Drive conditions for the transmitters were tuned to for certain eye characteristics and the eyes are not representative of normal devices.

Correlation of 100G SR4 TxVEC results with RxS results



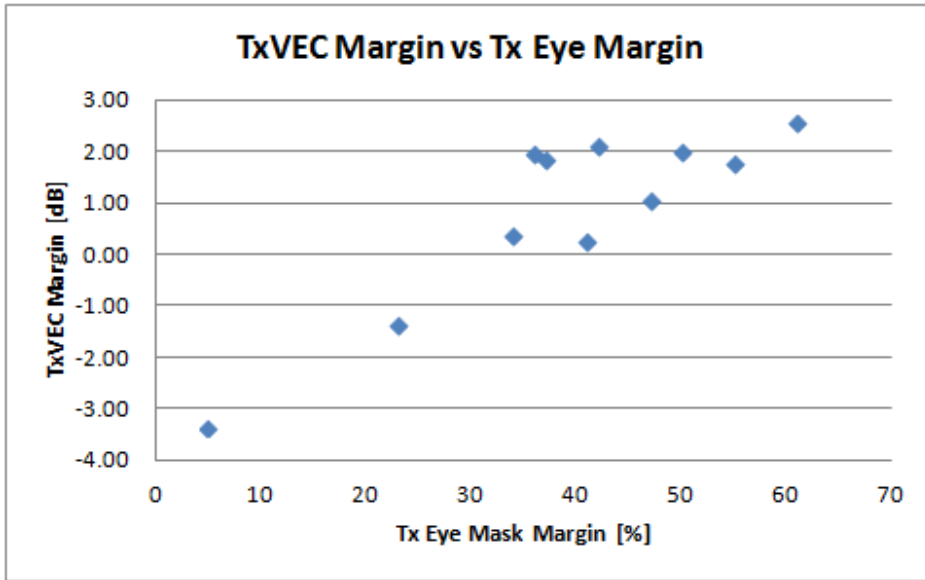
The above charts shows the correlation between TxVEC and RxS margins for B2B and 100 m OM4 cases.

Correlation of 100G RxS results for B2B, 100 m OM4 & 100 m OM3 cases



- The left chart shows a range of ~ 1.8 dB for RxS(OM4) margin & RxS(B2B) margin result pairs. The range includes the variation between two RxS measurements and the effect of the OM4 fiber. It's accepted in the industry that a range of 1 dB for RxS repeatability is very tight.
- In the right chart a range of ~ 2.7 dB for RxS(OM4) margin is shown for transmitters with positive TxVEC margin.
- The ability to predict worst case 100G SR4 link performance based on TxVEC results appears slightly worse than the ability to predict worst case 100G SR4 link performance based on RxS (B2B) results where a worst case Rx and cable plant are available.
- Since link margin estimates based on TxVEC results appear to be within the range of errors found for link margin estimates based on TDP results and TxVEC is a significantly easier measurement to implement, 802.3bm should replace the TDP metric with a TxVEC metric.

Correlation of 100G SR4 TxVEC & Eye Mask Margins



- The above chart shows the correlation between Tx Eye Mask margin results and TxVEC margin results, provided to show the range of eye quality included in this experiment.