



Update on Bandwidth Requirements for PAM

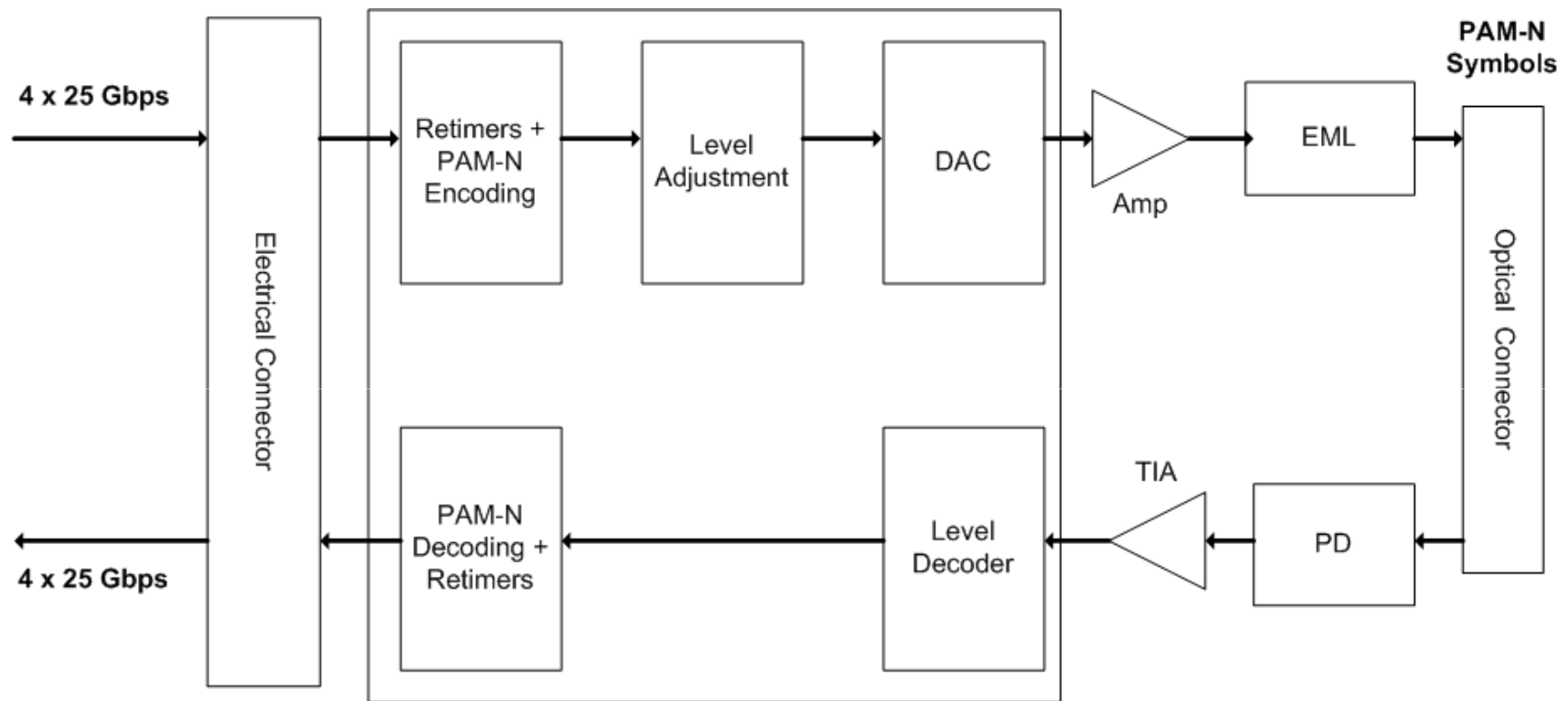
David Lewis, John Heaton, Beck Mason

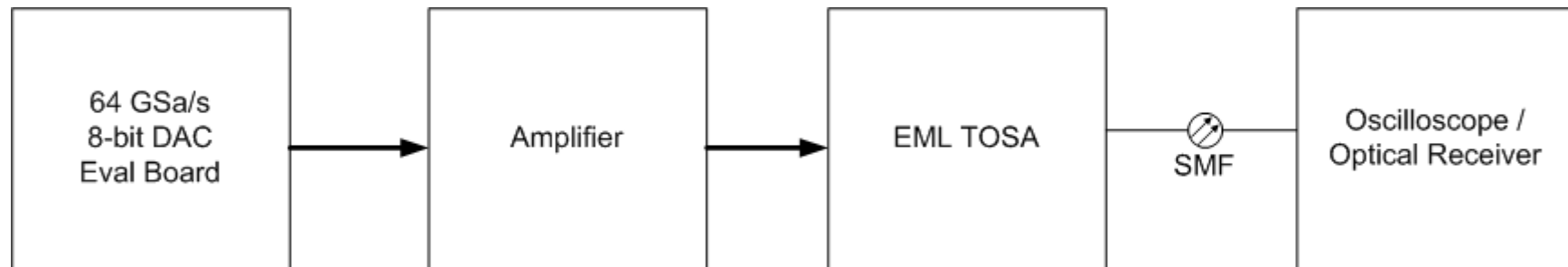
Next Generation 100G Optics Study Group
May 2012

- Background
- 100G SMF PMD with PAM
- Experimental Setup
- Initial Results
- Future Work

- heaton_01_0312_ng100goptx presented the concept for digital linearization of a DAC to compensate for non-linearity in the electrical-to-optical conversion

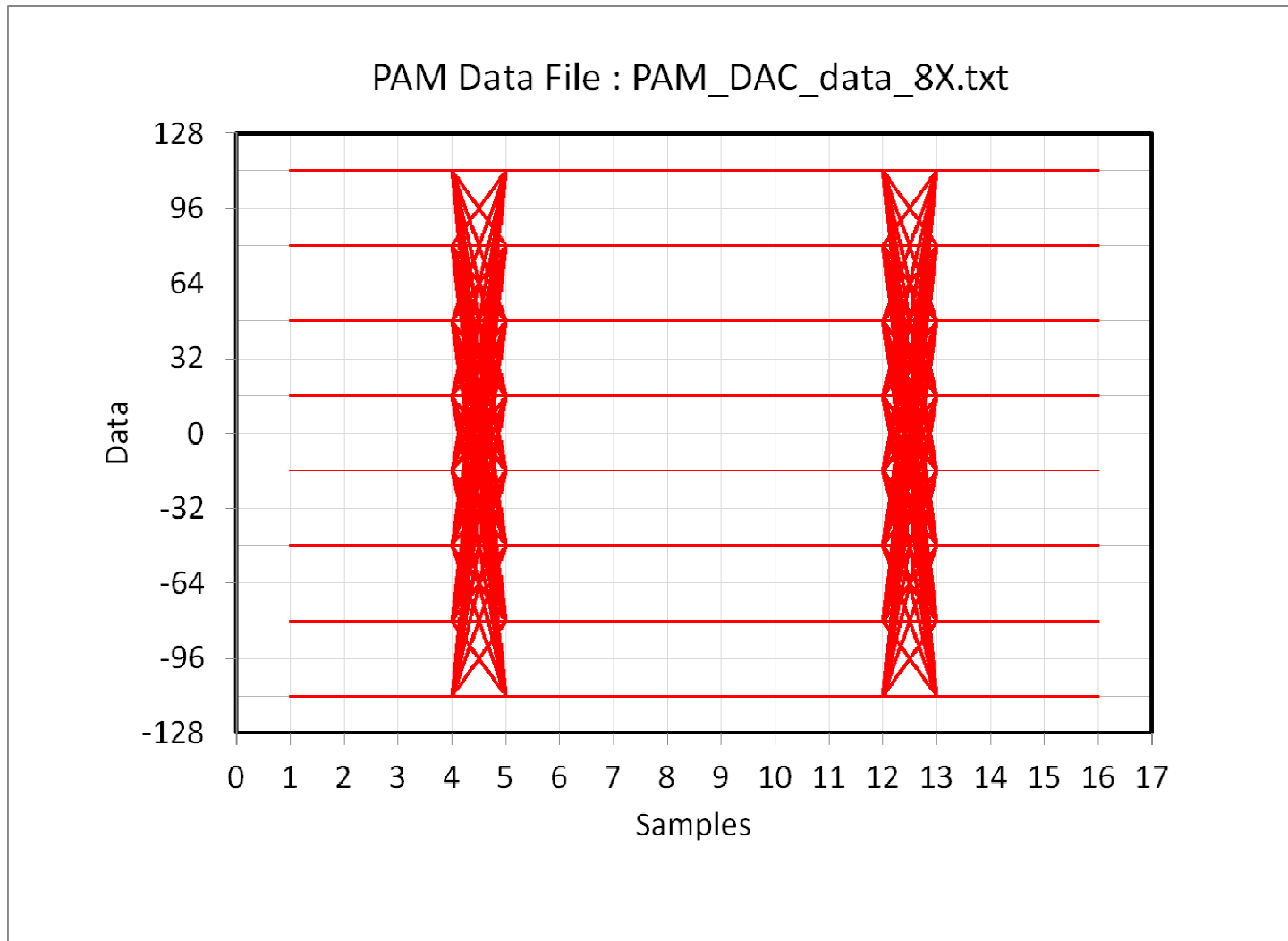
100G SMF PMD with PAM





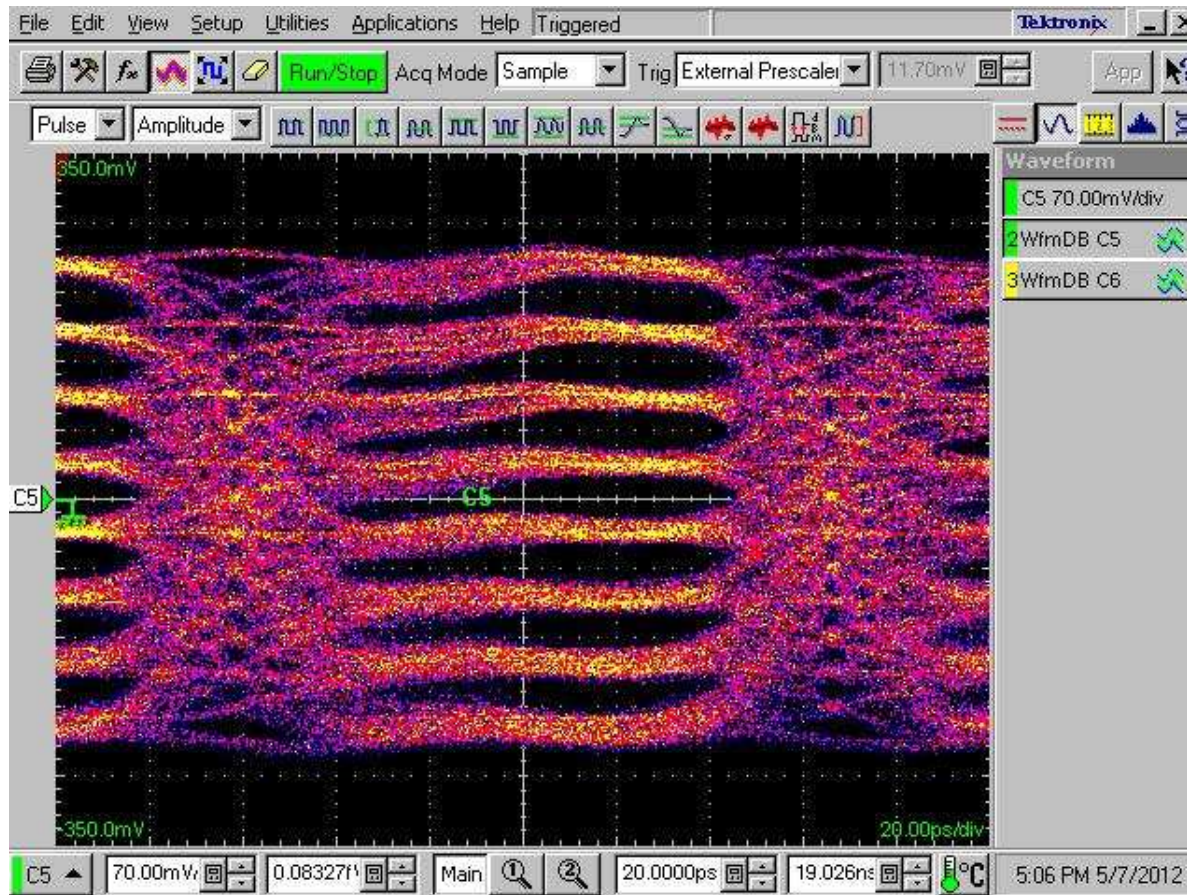
- DAC evaluation board from Fujitsu
- SMF is a short patch cord connecting the TOSA directly to the optical port of the oscilloscope

PAM-8 data file - unmodified



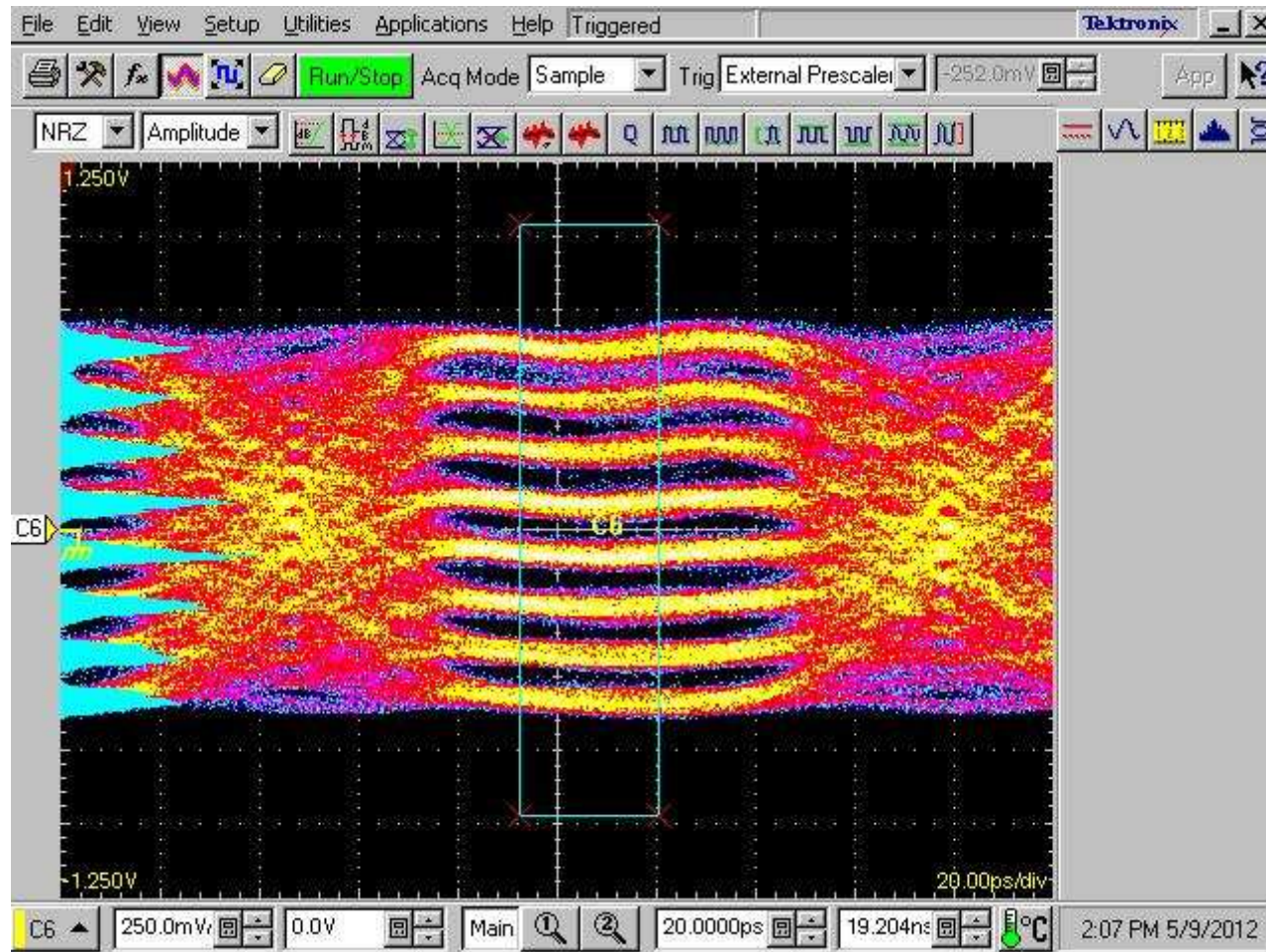
lewis_01a_0512_optx.pdf

PAM_DAC_data_8X (DAC Output)



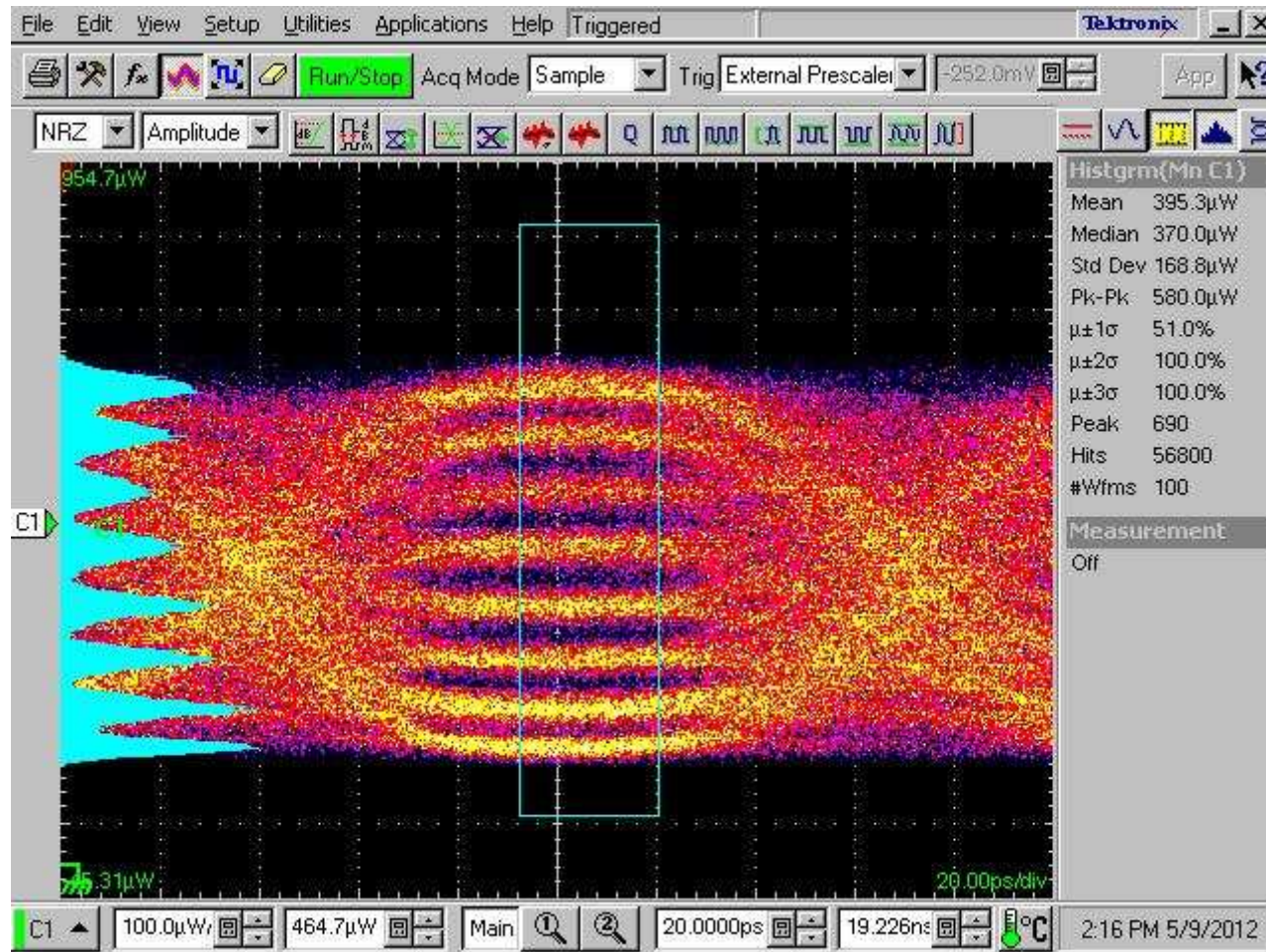
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PAM_DAC_data_8X (Amplifier Output)



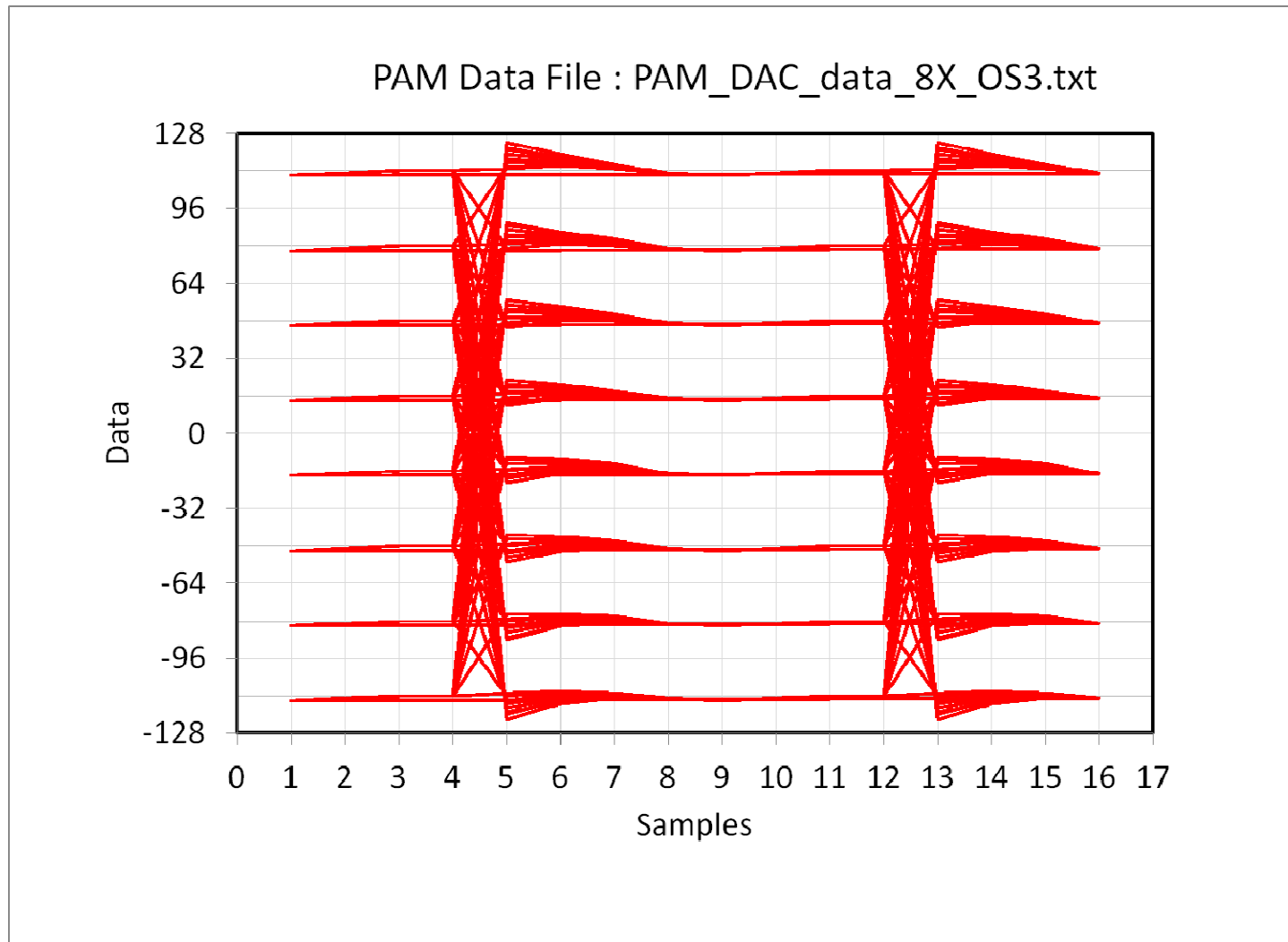
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PAM_DAC_data_8X (TOSA Output)



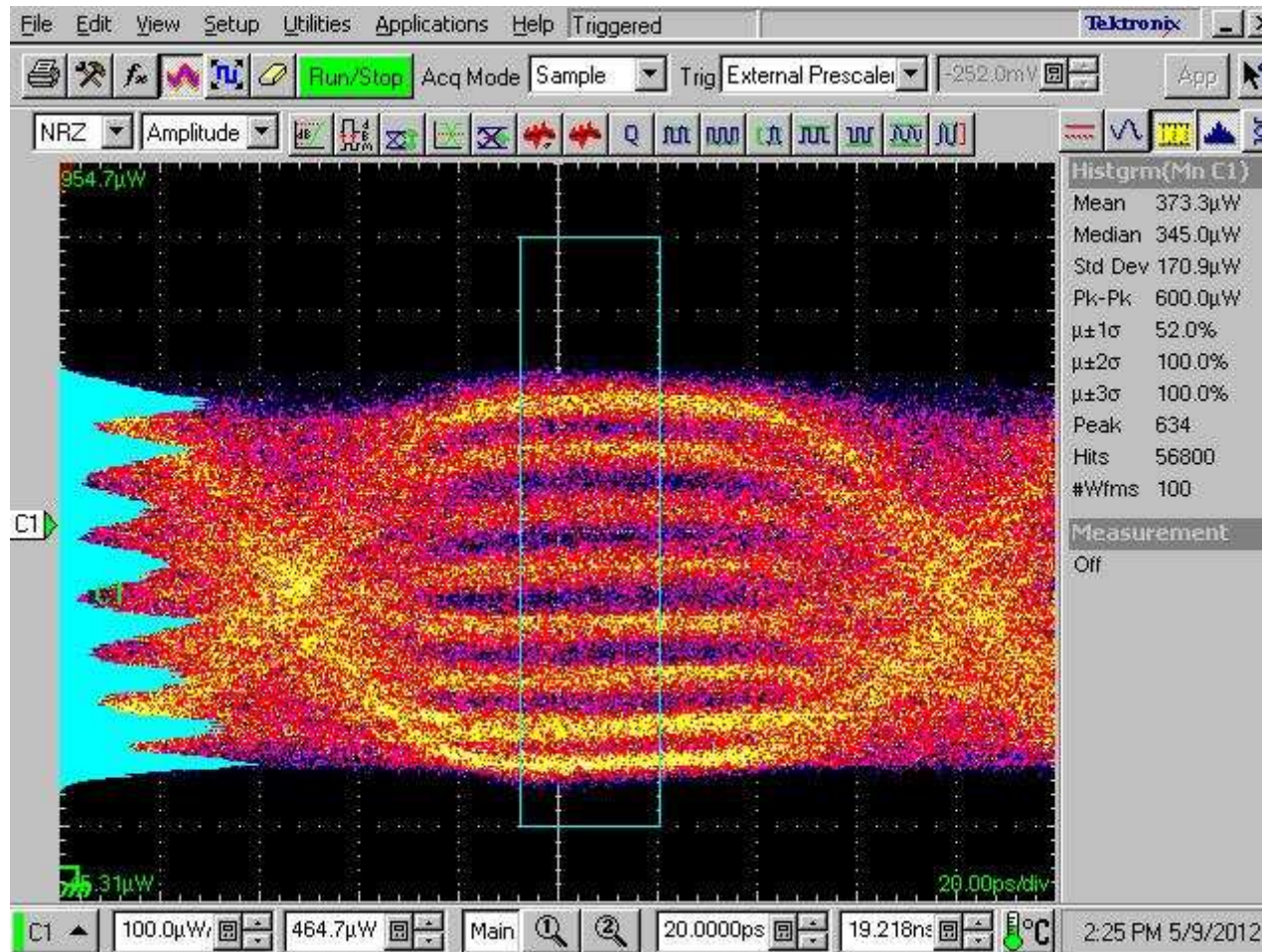
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PAM-8 data file with overshoot added



lewis_01a_0512_optx.pdf

PAM_DAC_data_8X_OS3 (TOSA Output)



lewis_01a_0512_optx.pdf

- PAM-8 Optical Transmitter at 8 GBd demonstrated
 - Effective throughput of 24 Gb/s using 10Gb/s EML
- Initial Results show clear separation between the 8 optical levels
- Adding overshoot adjustment to the DAC digital inputs improved eye width compared to simple stepped data
- Future work
 - Use higher bandwidth EML to increase throughput
 - Remove high frequency ripple from DAC outputs
 - Implement level spacing compensation at DAC input to improve optical signal level spacing over all levels