

Eic Main FPC Prototype

Signal Integrity tests on prototype main FPC

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20251113



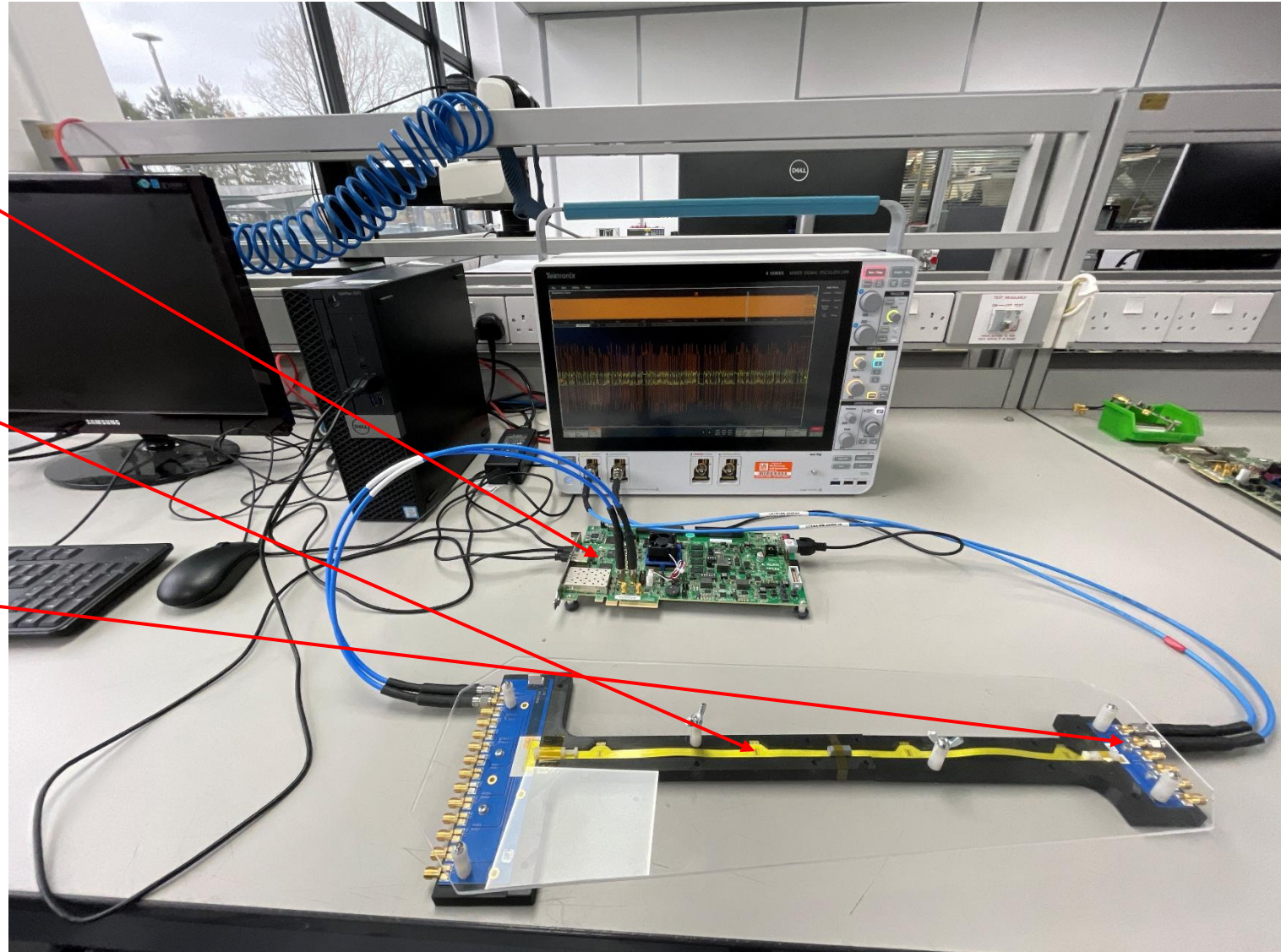
Science and
Technology
Facilities Council

Main FPC connected to KCU105 and Tektronix MSO6B 'scope

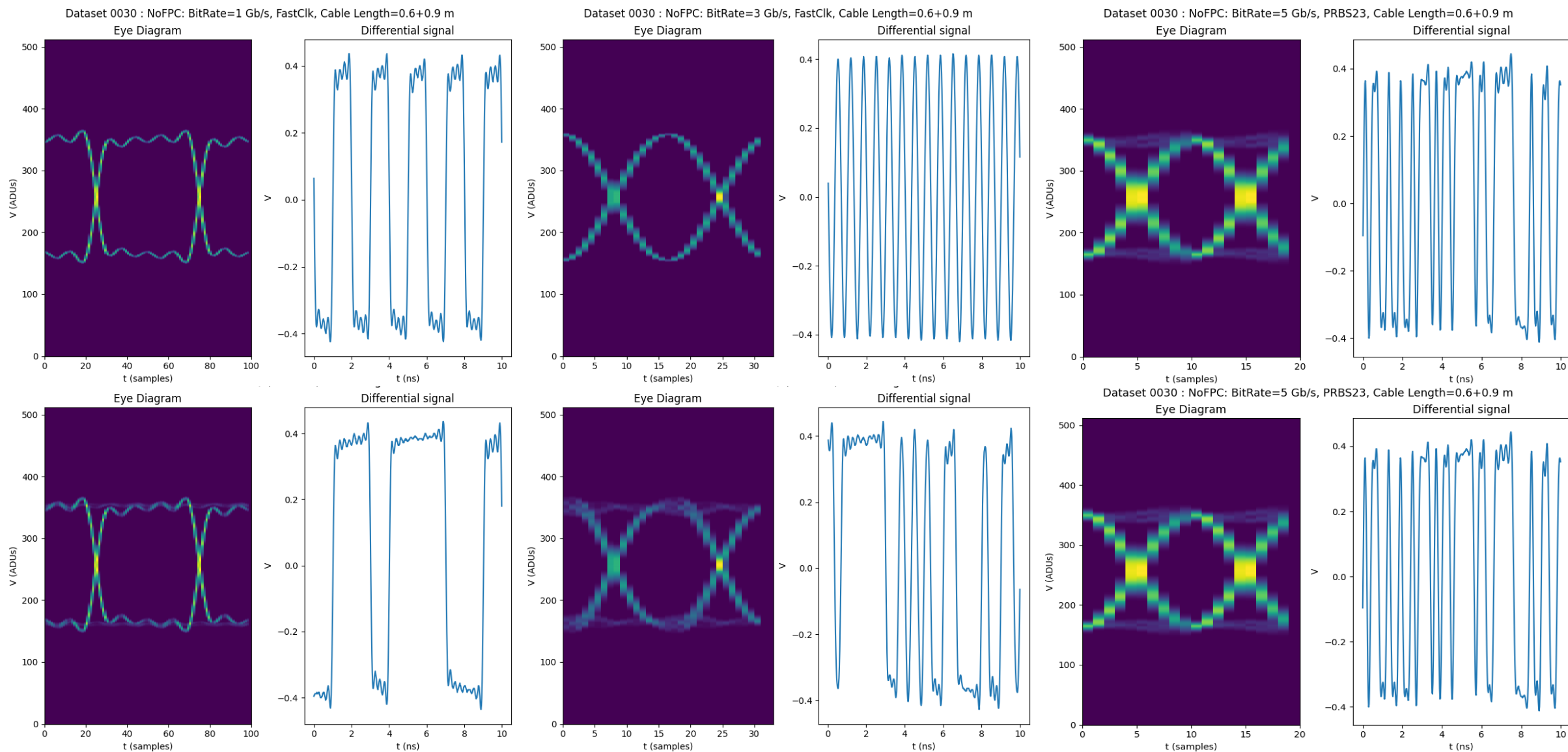
KCU105 AMD
Kintex Ultrascale+
FPGA board

Main FPC with test
boards left and right.
Cables connected to
SCTRL1.

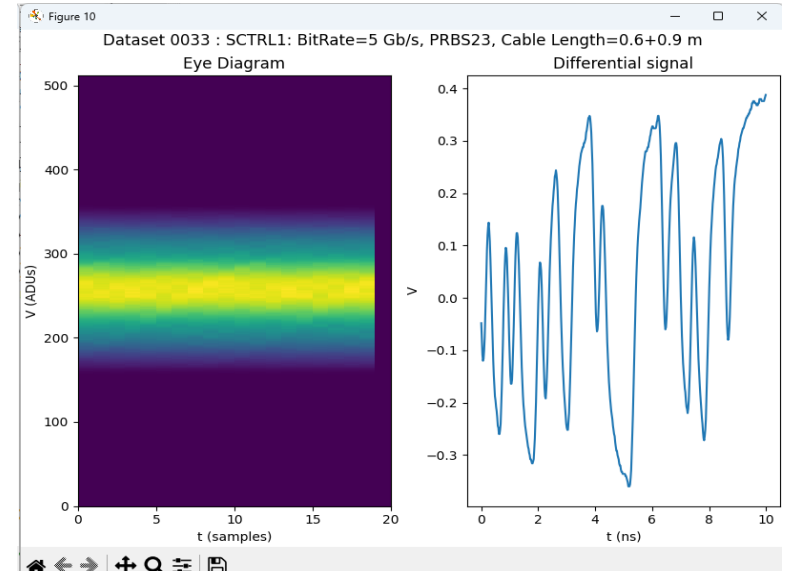
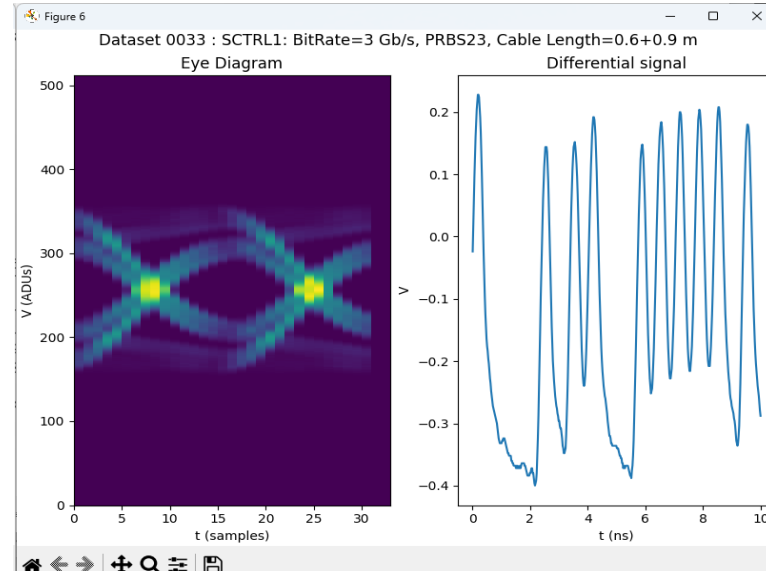
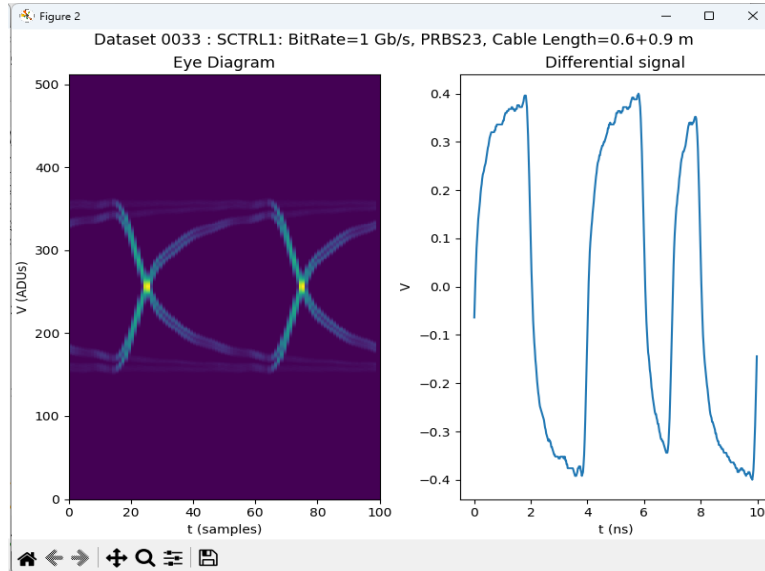
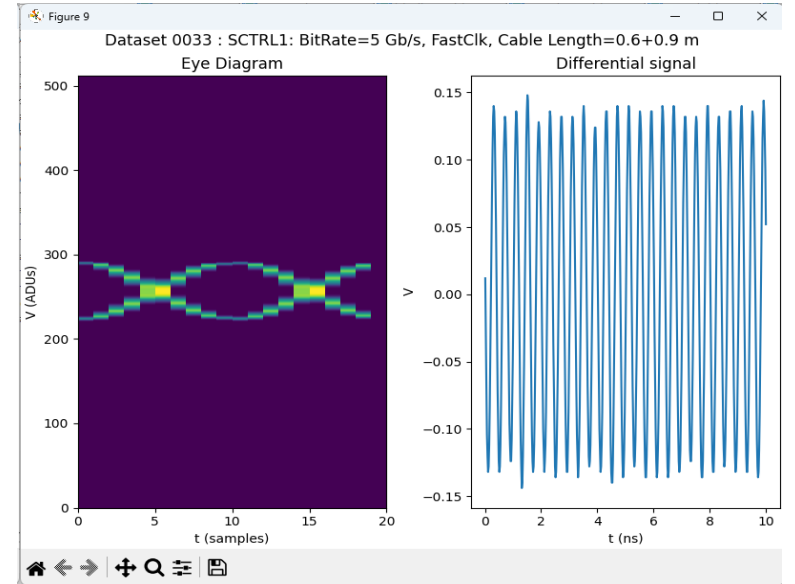
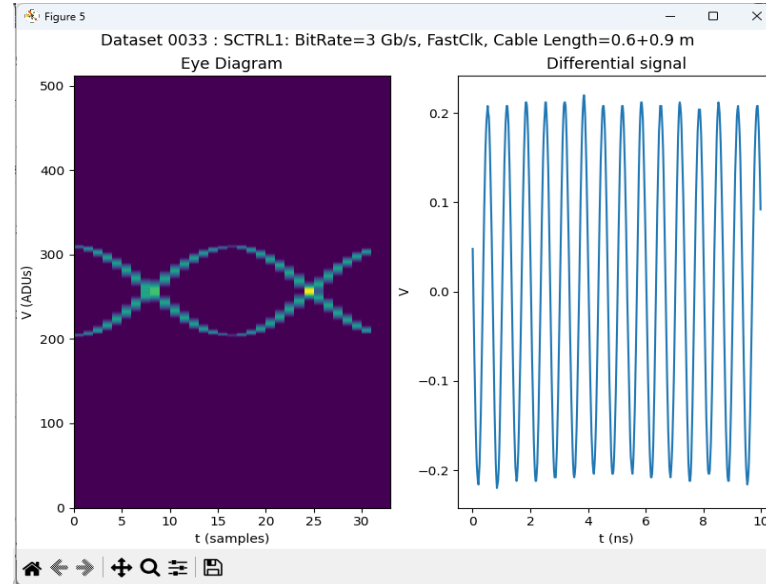
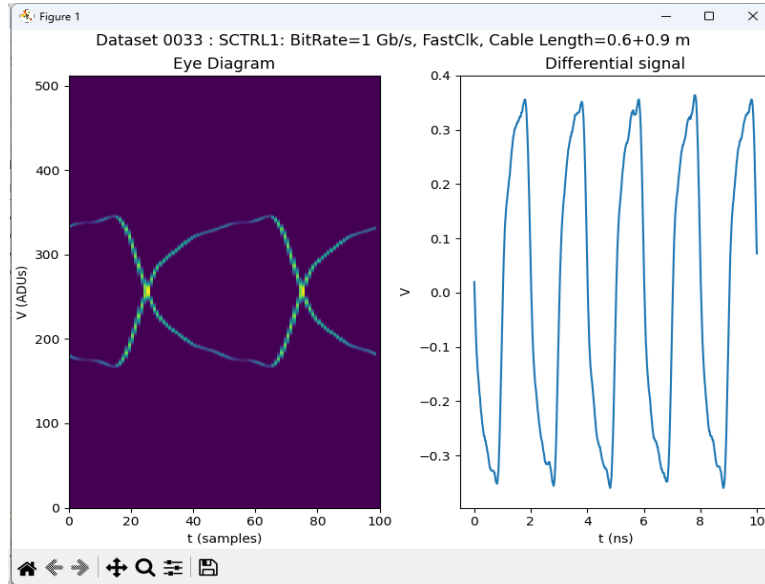
Termination
resistors removed
from RHS



Test rig (KCU105, cables and 'scope) without FPC.

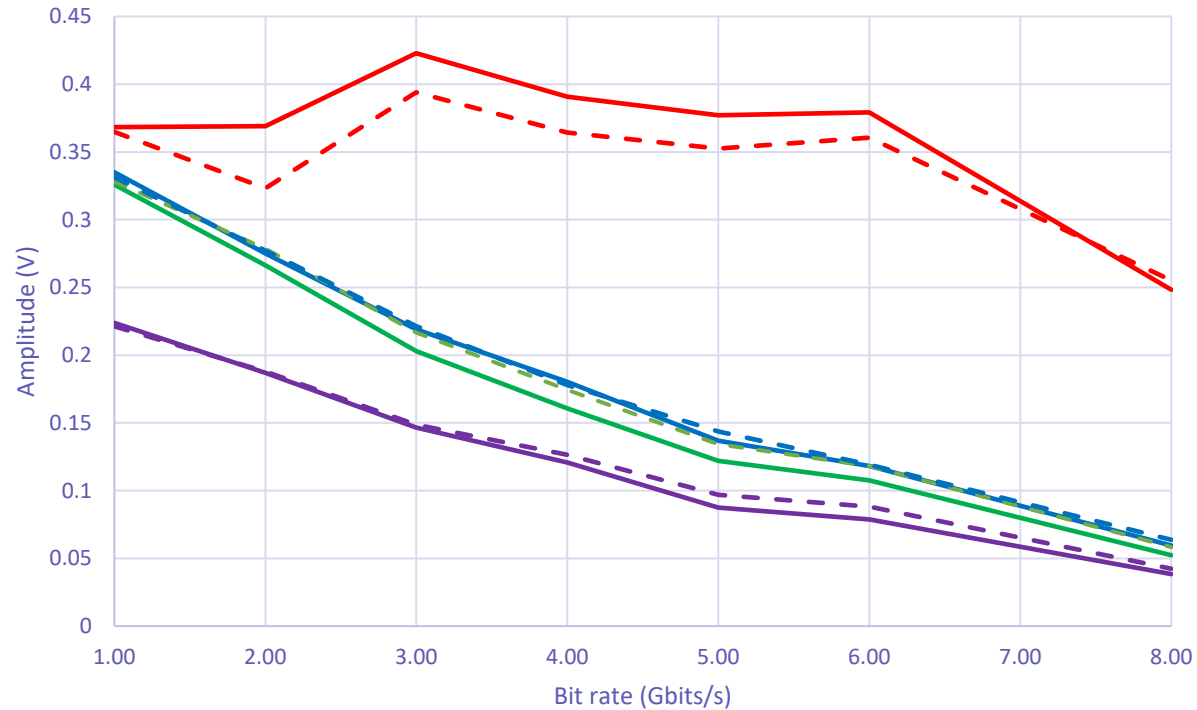


Signal transmitted via FPC SCTRL1.



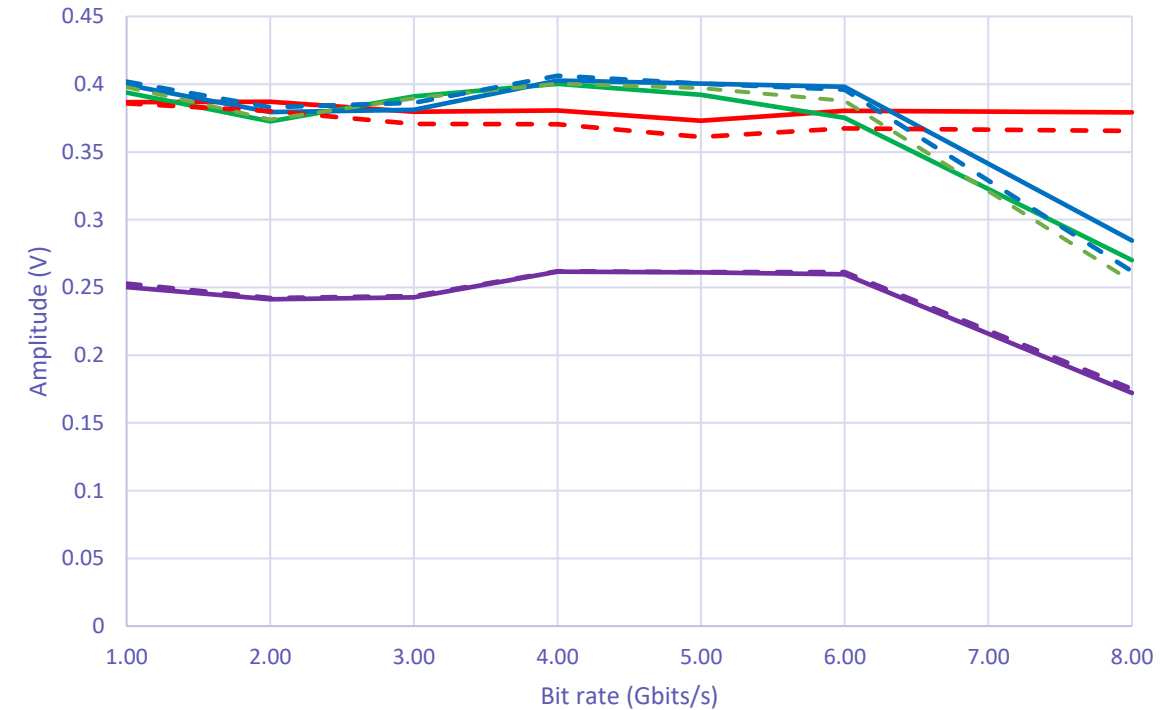
Amplitudes using Fast Clk and PRBS-23 patterns

Amplitude using Fast Clock pattern



— NoFPC, FastClk, CH_P — SCTRL1, FastClk, CH_P — SCTRL2, FastClk, CH_P
— SCTRL3, FastClk, CH_P - - - NoFPC, FastClk, CH_N - - - SCTRL1, FastClk, CH_N
- - - SCTRL2, FastClk, CH_N - - - SCTRL3, FastClk, CH_N

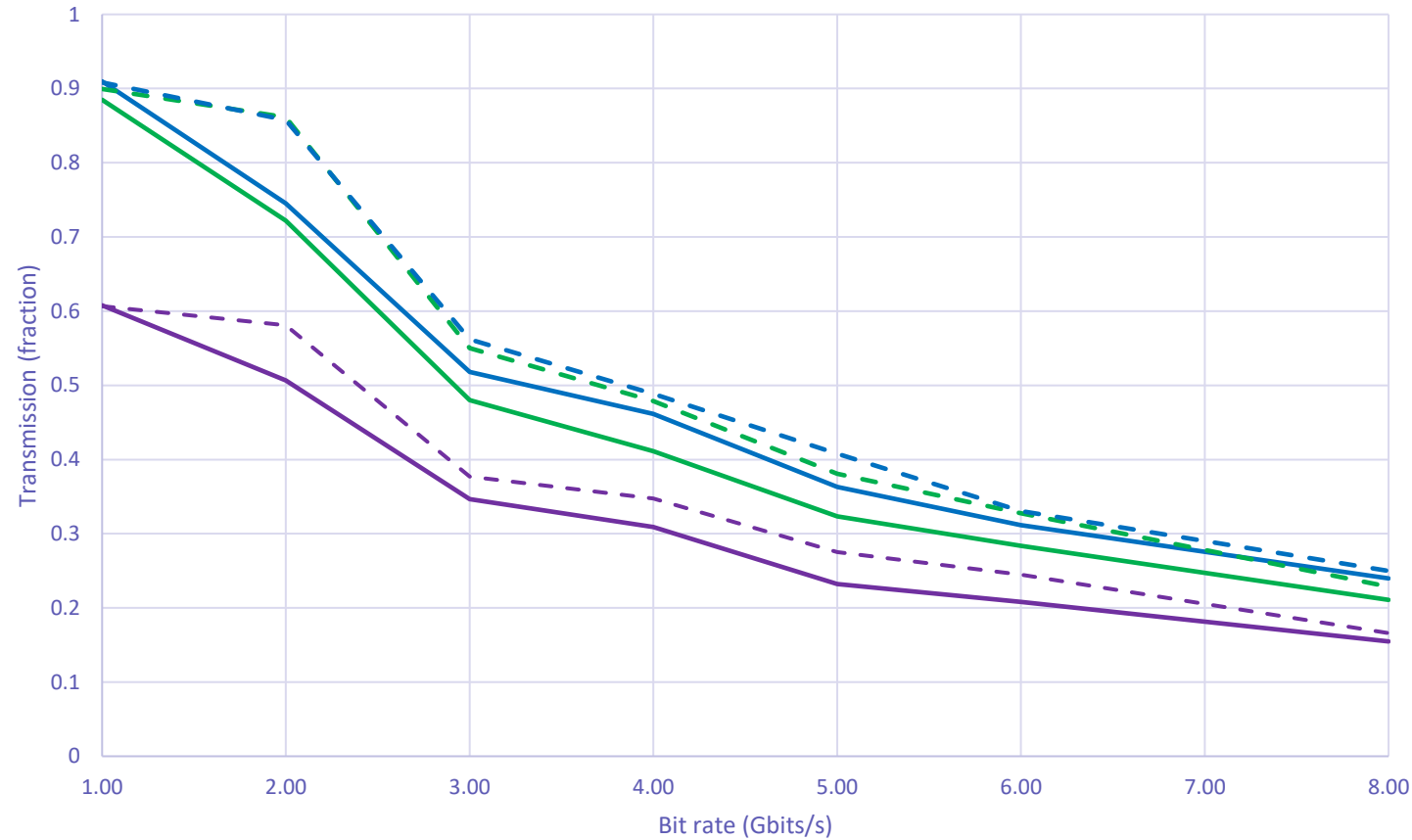
Amplitude using PRBS-23 pattern



— NoFPC, PRBS23, CH_P — SCTRL1, PRBS23, CH_P — SCTRL2, PRBS23, CH_P
— SCTRL3, PRBS23, CH_P - - - NoFPC, PRBS23, CH_N - - - SCTRL1, PRBS23, CH_N
- - - SCTRL2, PRBS23, CH_N - - - SCTRL3, PRBS23, CH_N

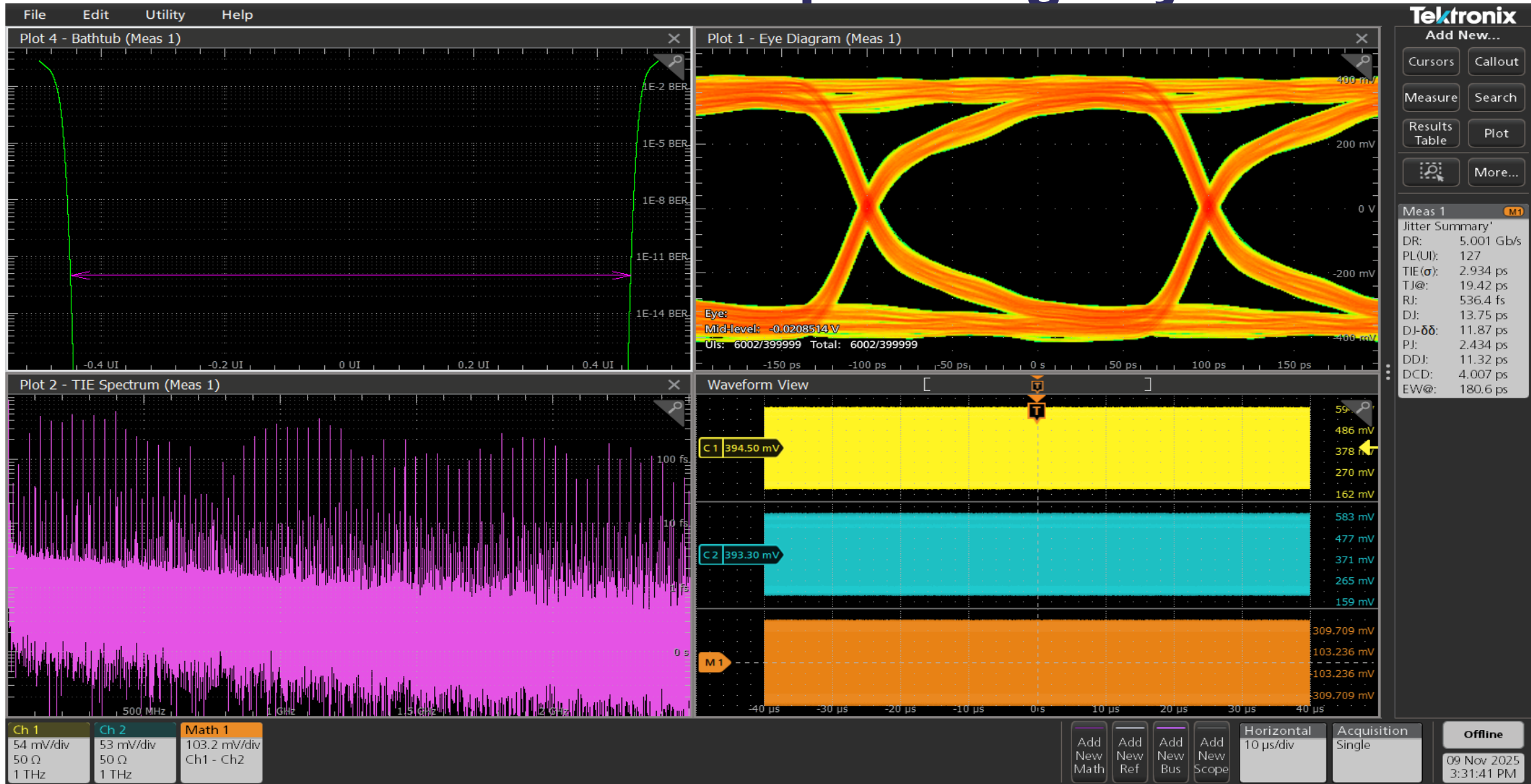
Transmission of the fast clock signal

Transmission using Fast Clk pattern

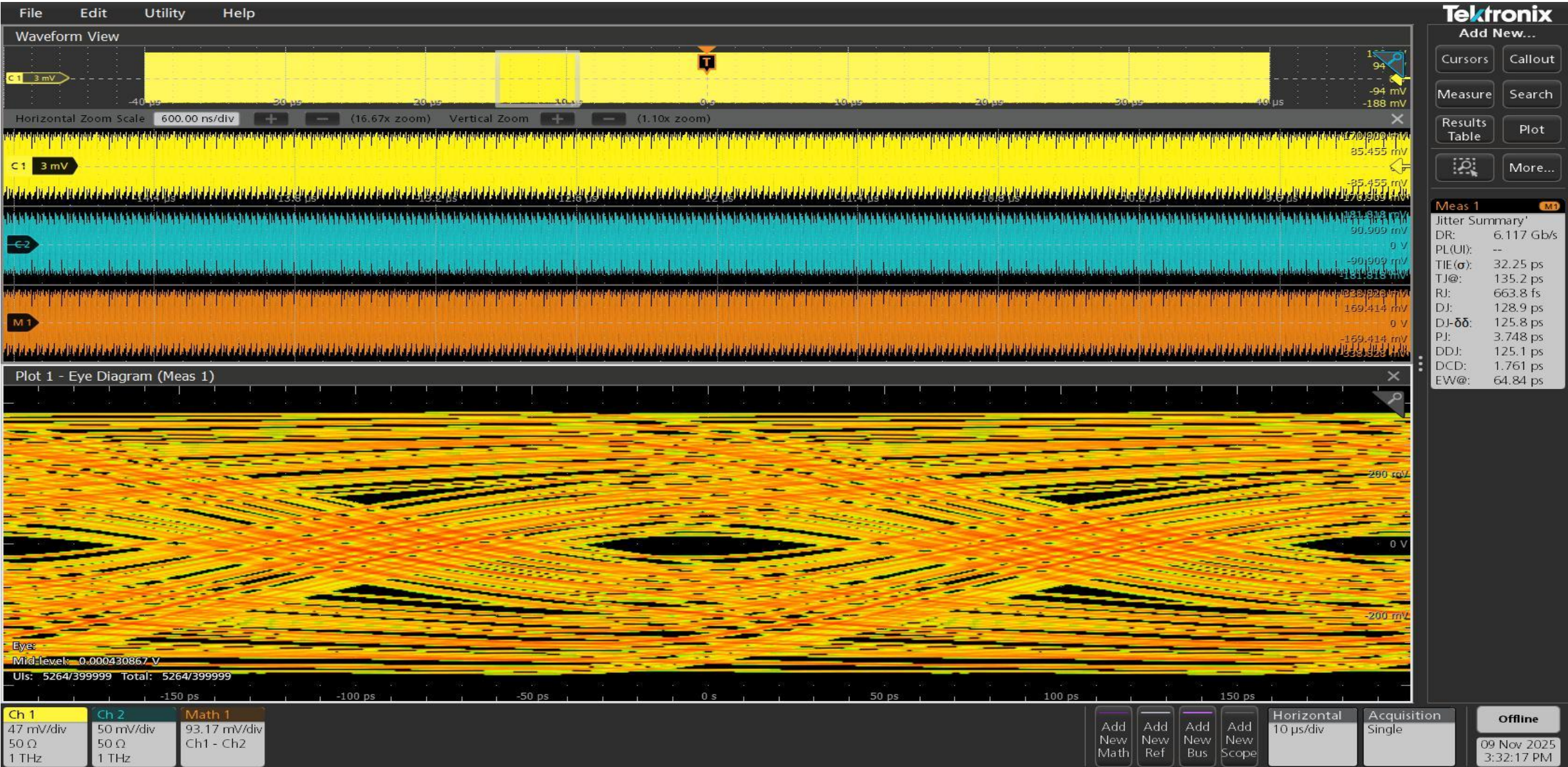


— CTRL1, FastClk, CH_P — CTRL2, FastClk, CH_P — CTRL3, FastClk, CH_P
- - CTRL1, FastClk, CH_N - - CTRL2, FastClk, CH_N - - CTRL3, FastClk, CH_N

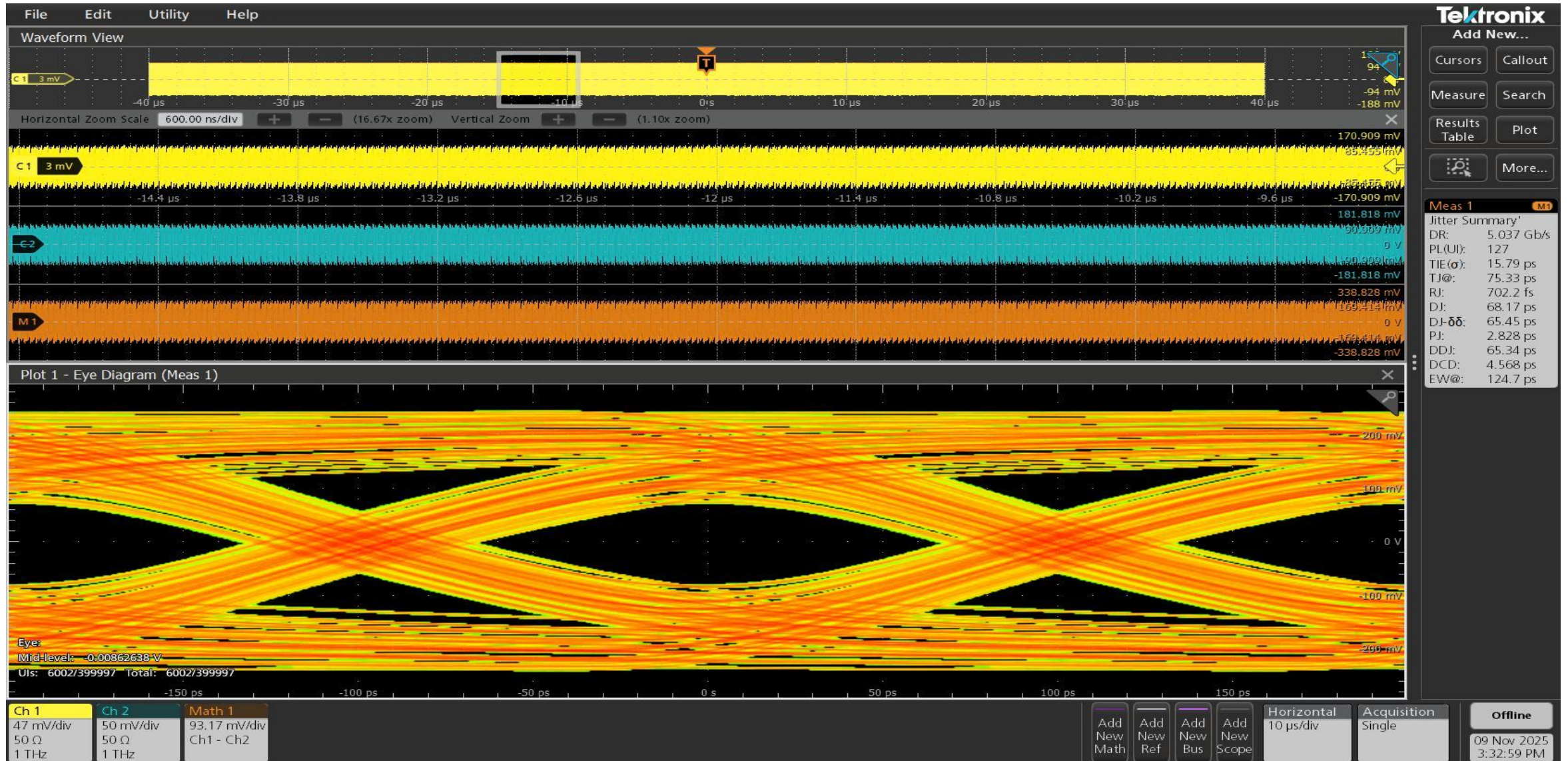
KCU105 to Tek 25 GHz scope using Crystek cables



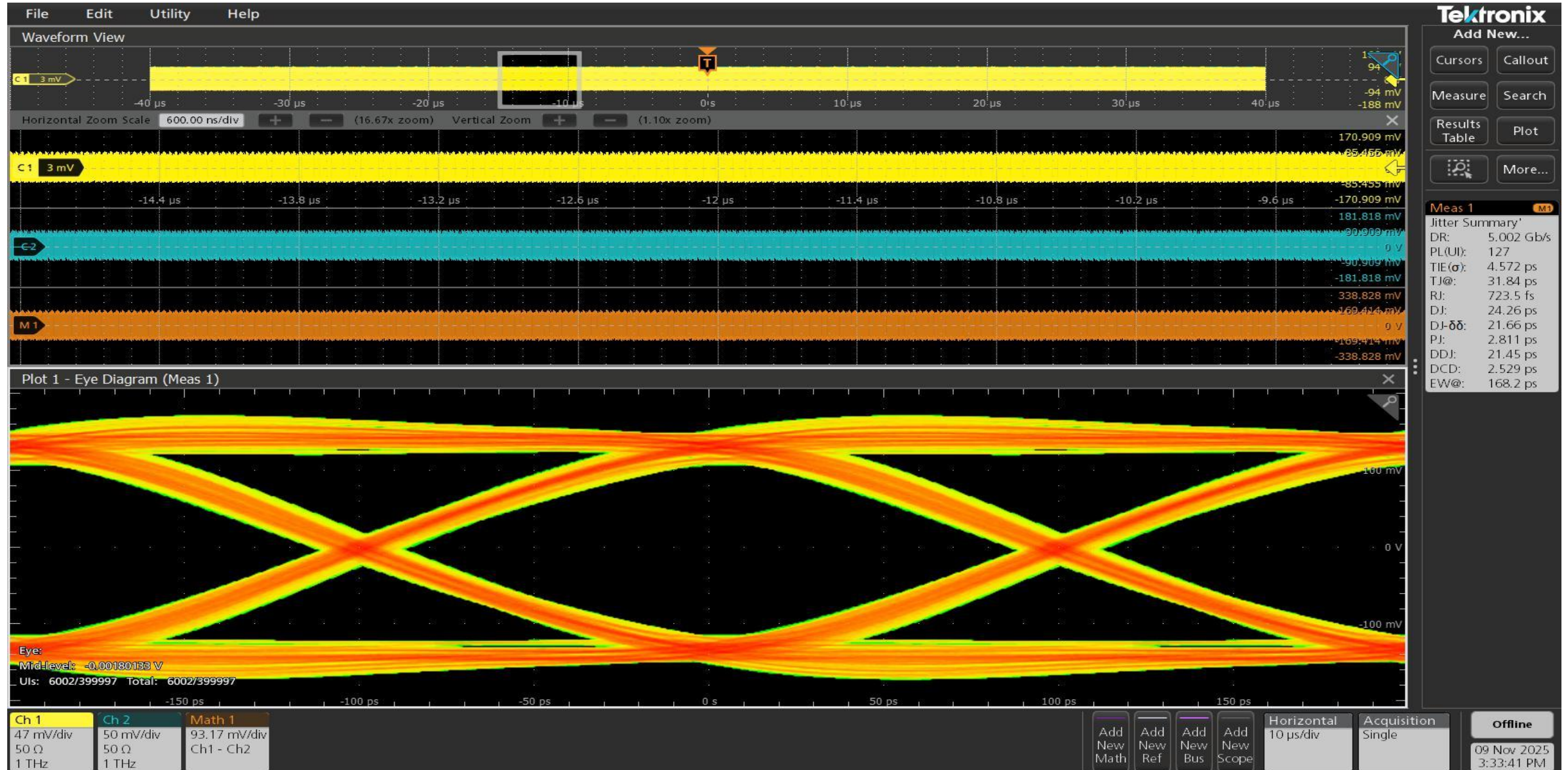
Using Main FPC SCTRL1 at 5 Gbits/s



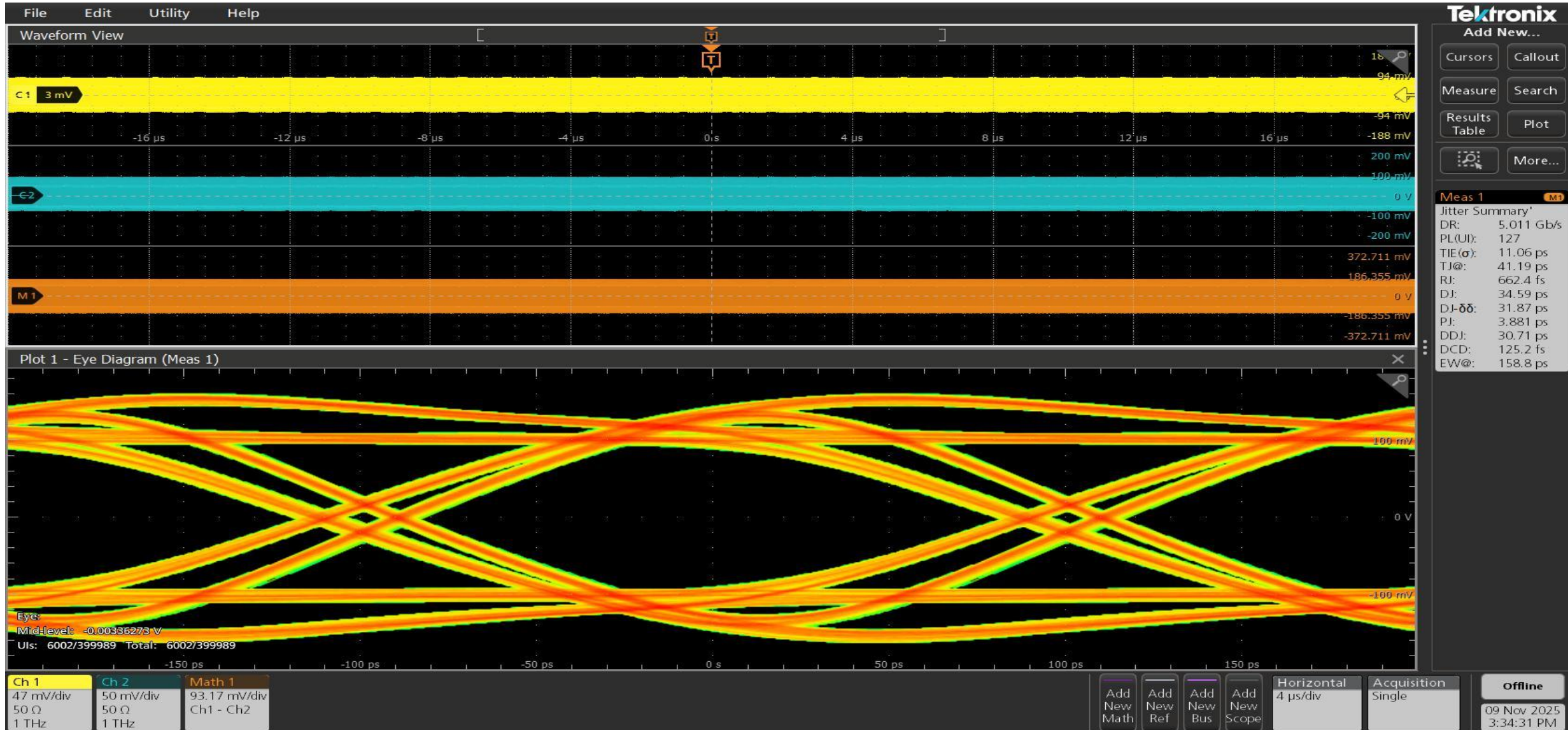
FPC SCTRL1 at 5 Gbits/s with 4 dB Post-Cursor



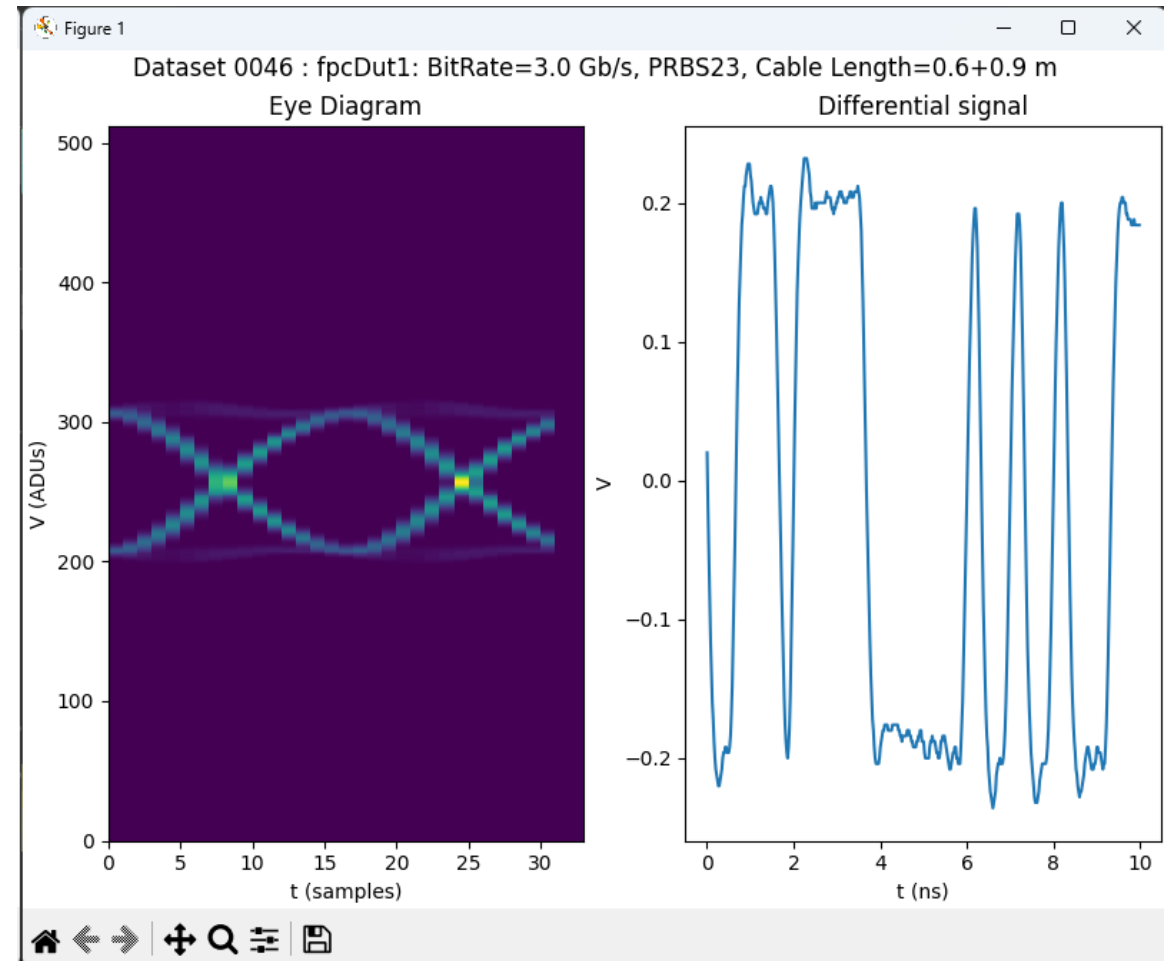
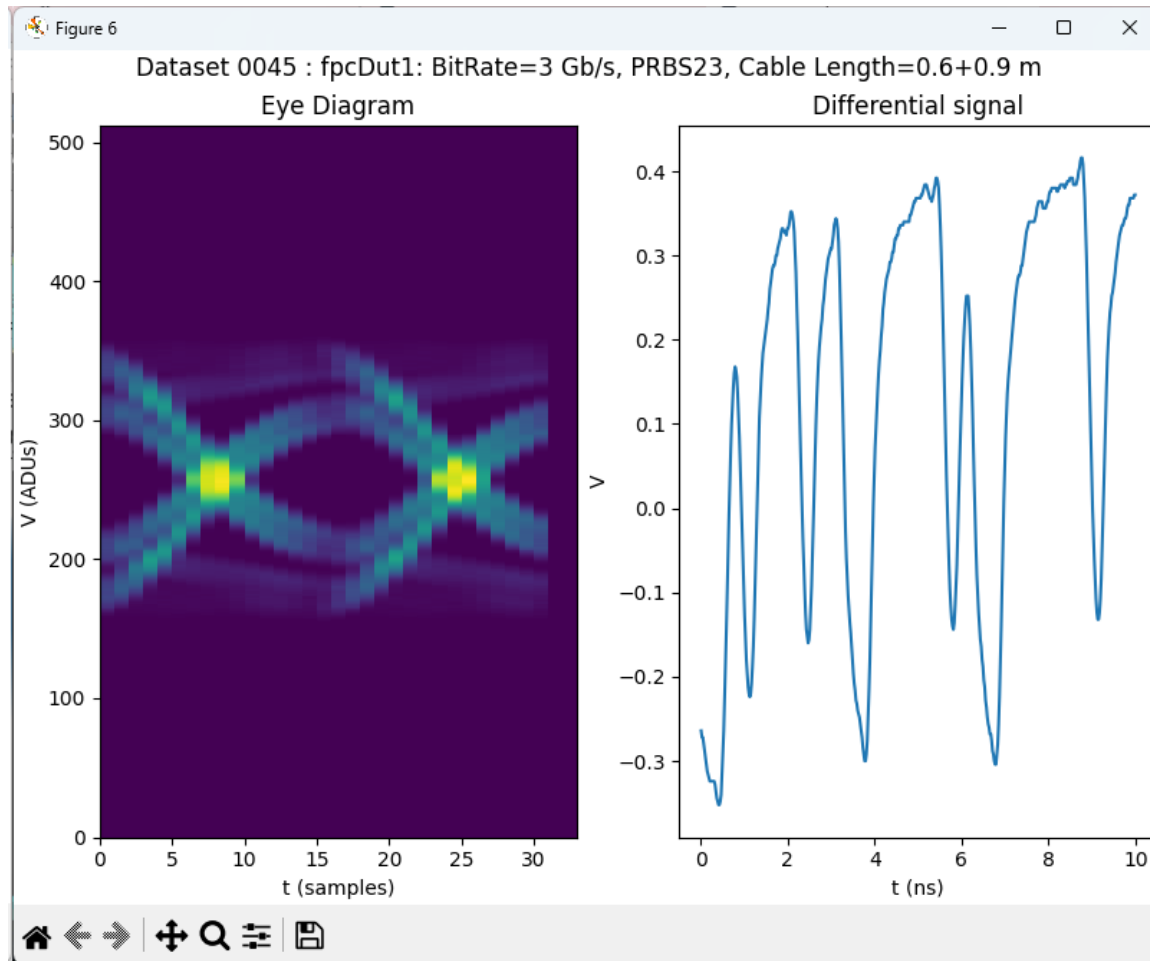
FPC SCTRL1 at 5 Gbits/s with 8.5 dB Post-Cursor



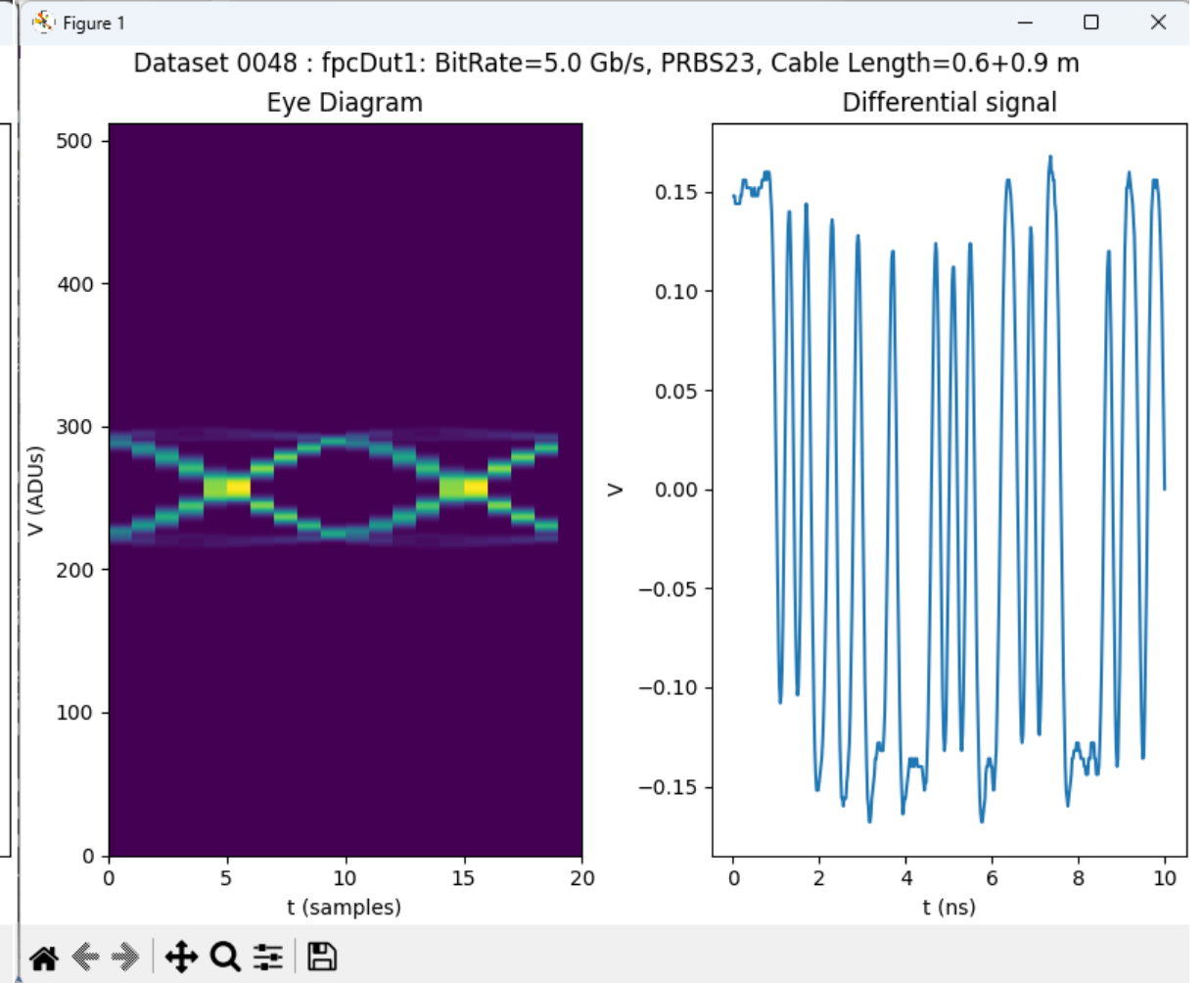
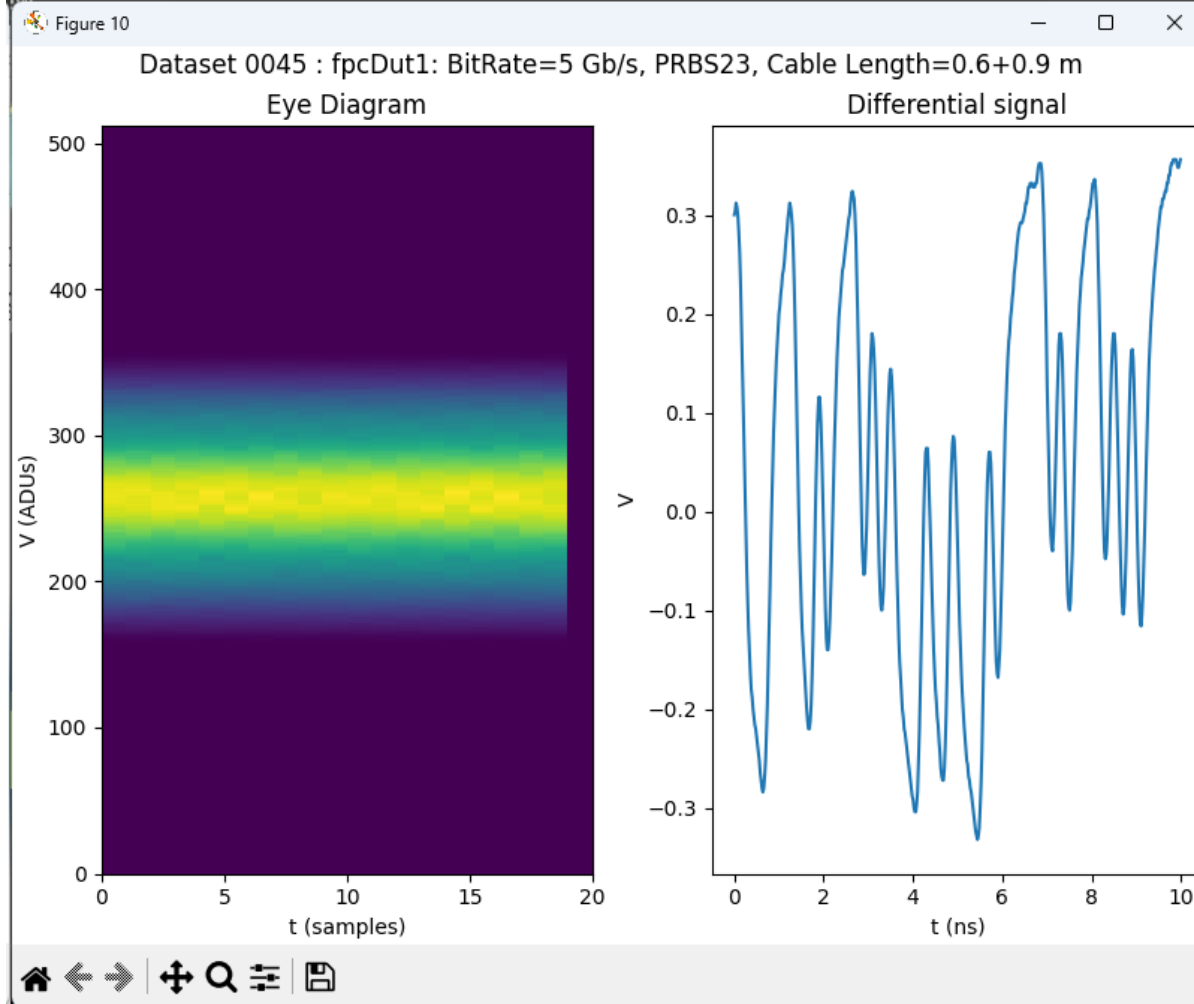
FPC SCTRL1 at 5 Gbits/s with 12 dB Post-Cursor



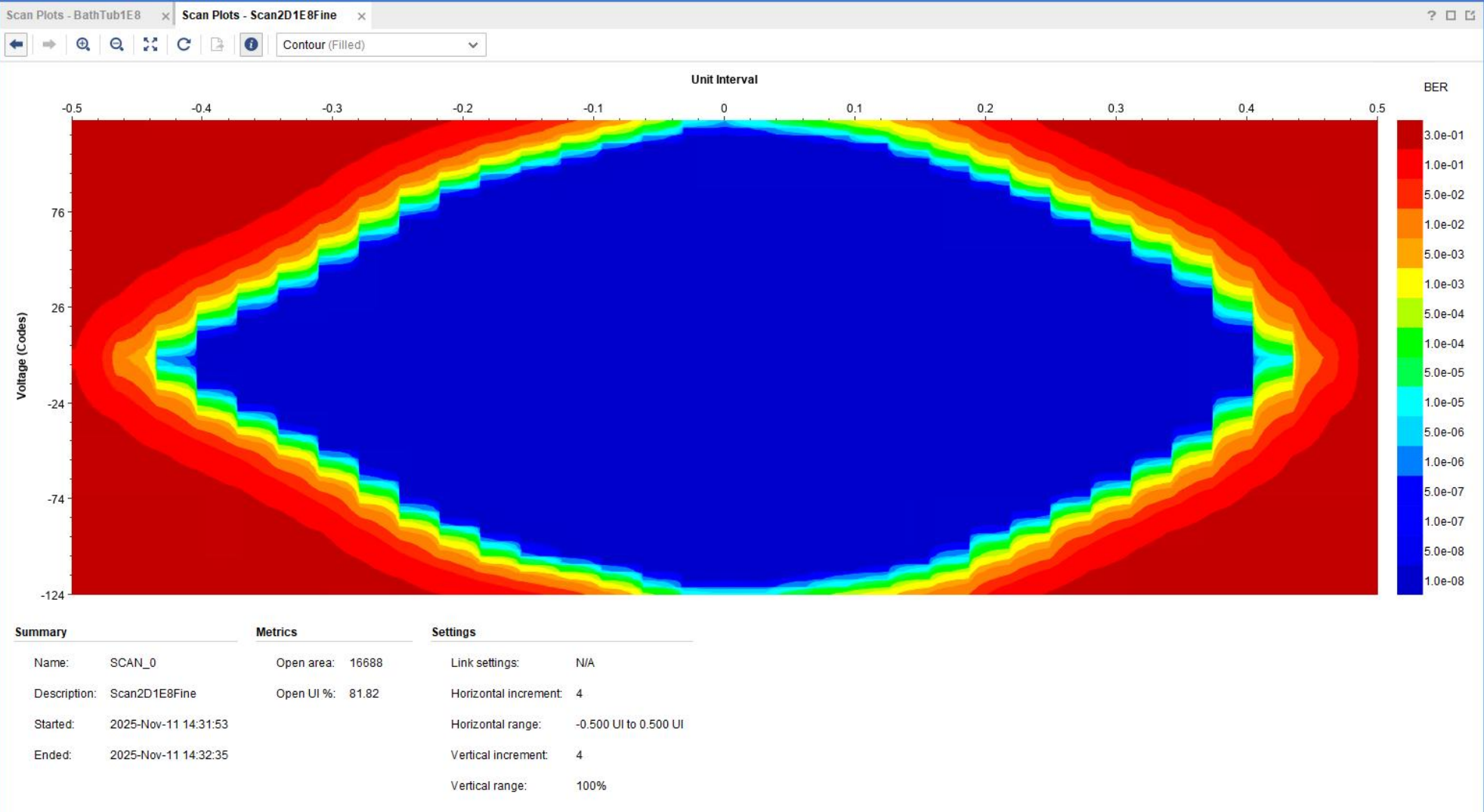
3 Gbits/s PRBS with and without a 6 dB post-cursor



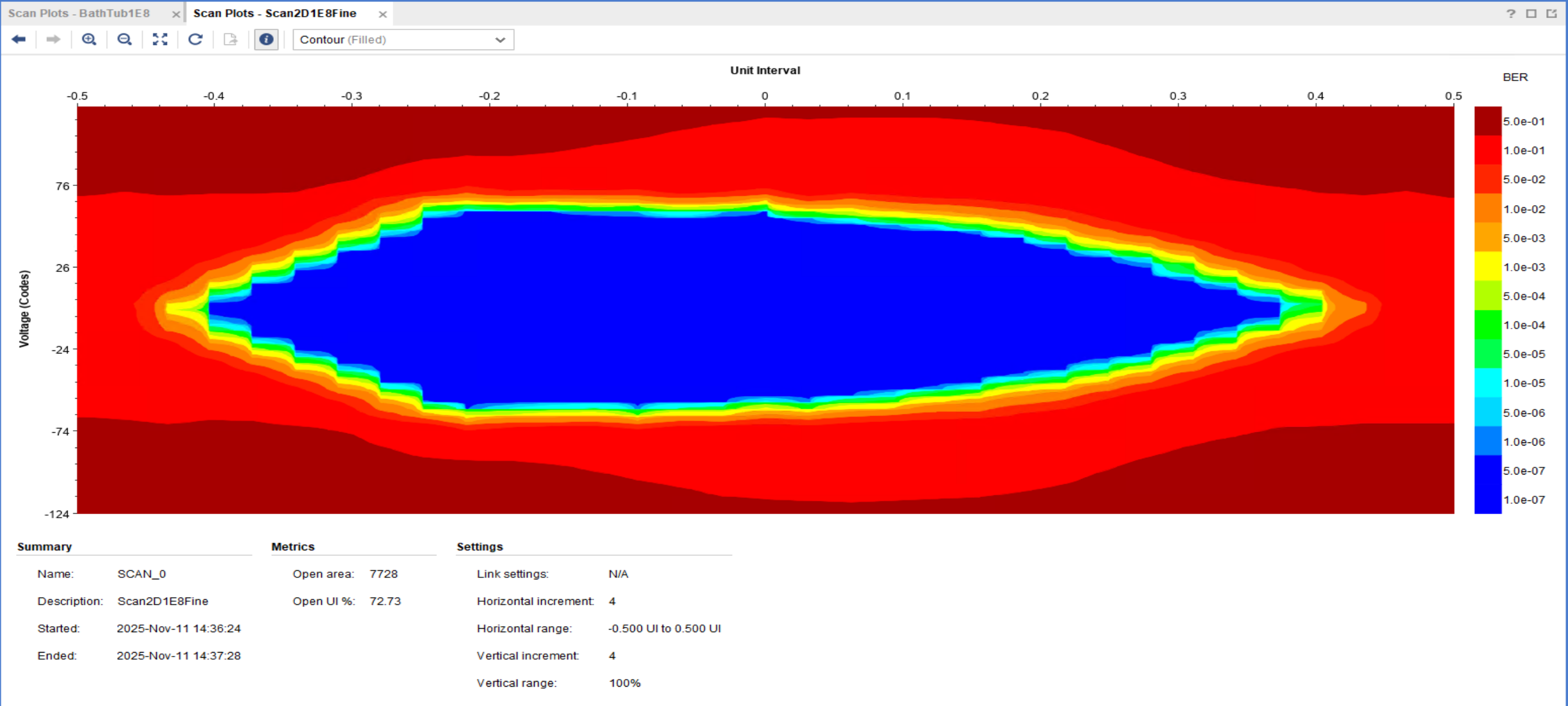
5 Gbits/s PRBS with and without a 8.52 dB post-cursor



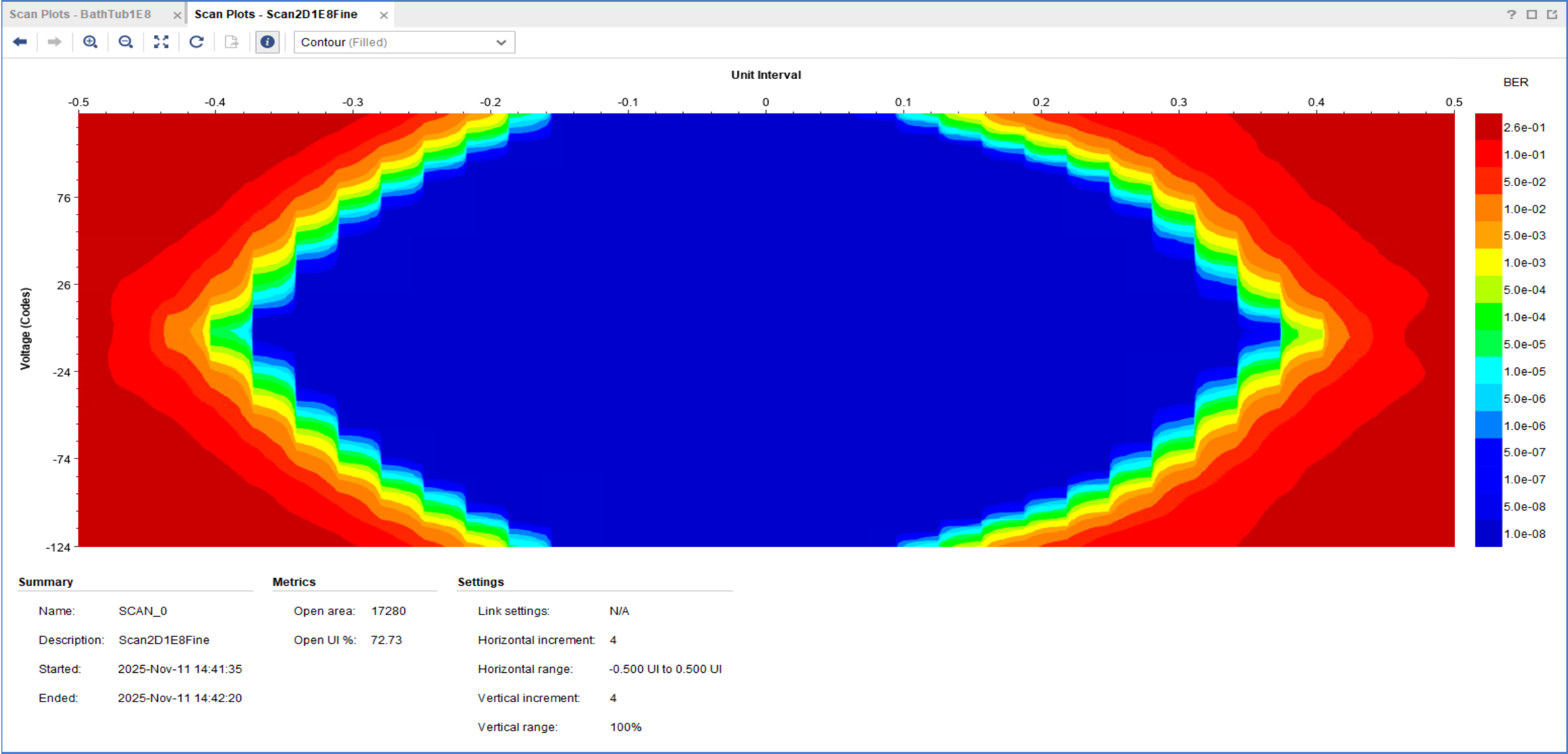
Ibert scans using Vivado, 5GBits/s, No DFE, No Post-Cursor. LPM linear equaliser in use.



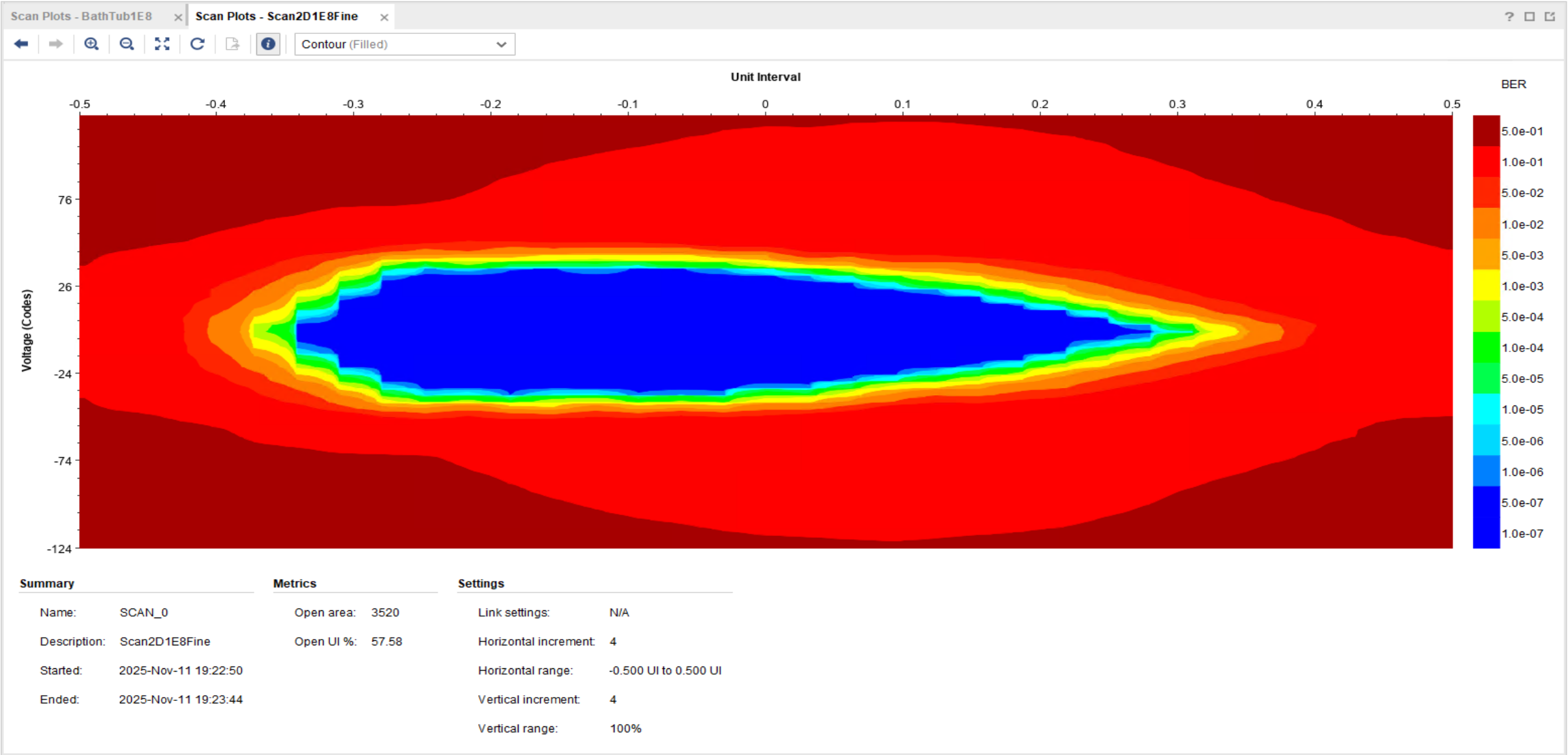
5GBits/s, With DFE, No Post-Cursor.



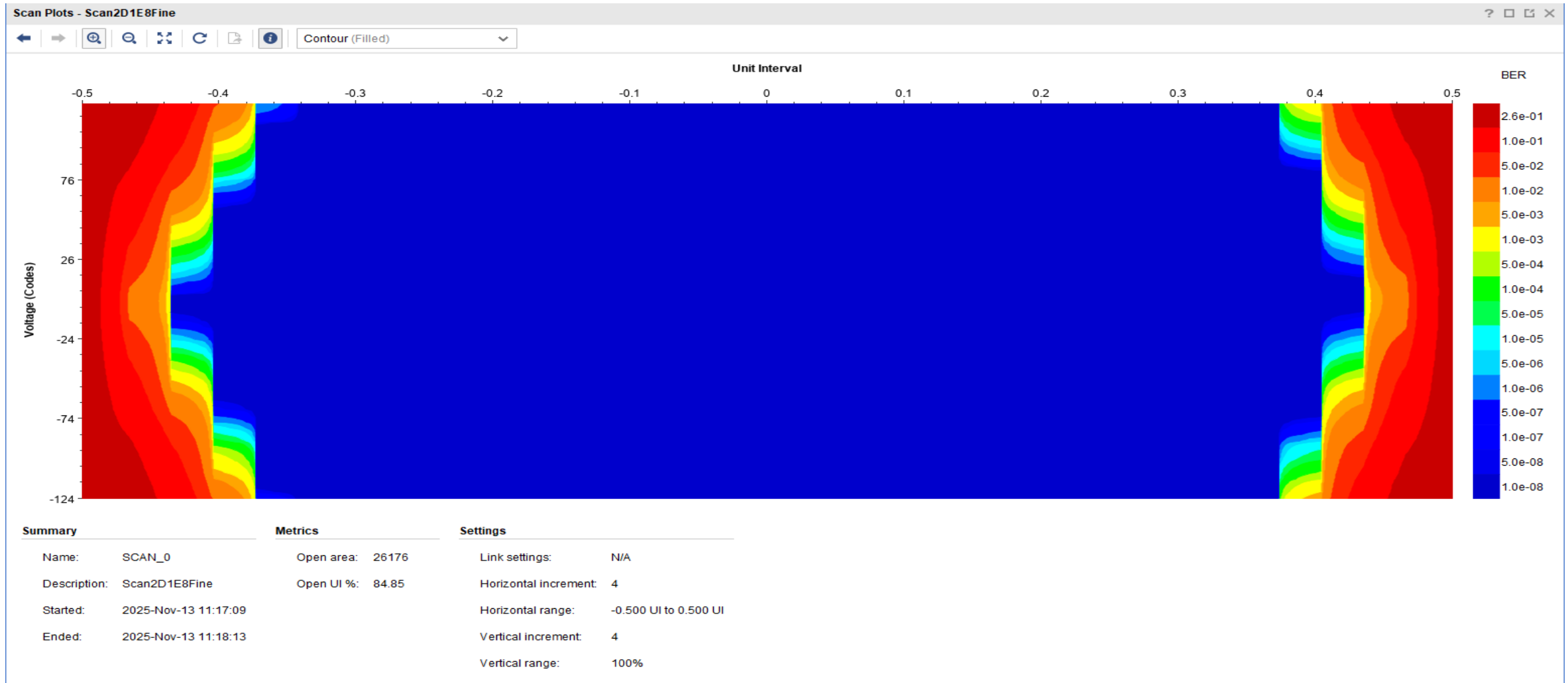
5GBits/s, No DFE and 8.5 dB Post-Cursor.



5GBits/s, With DFE and 8.5 dB Post-Cursor.



5GBits/s, No FPC No DFE No Post-Cursor.



Testing just the cables, note larger amplitude and faster rise time.