Quantum™

T10/00-195r0

Ultra320 SCSI into a Fully Populated 10-slot Backplane

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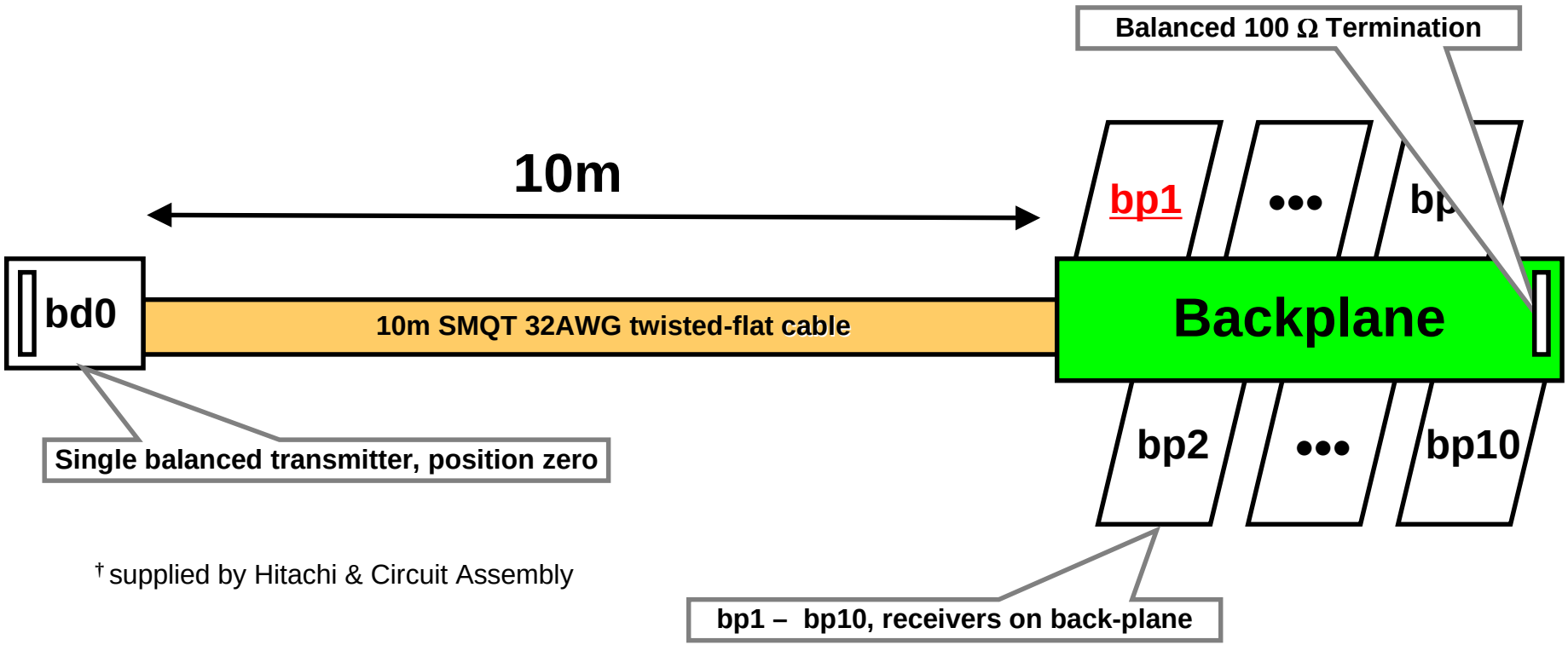
Introduction

- **We wanted to obtain measurements on additional standard "worst-case" system configurations.**
  - **The system used to gather data in this presentation is from a major manufacturer.**
  - **This system has low backplane impedance resulting in greater than 50% attenuation @ 80 MHz.**
- **Margins for this system were evaluated with the same techniques as used for our other Ultra320 data:**
  - **The signals were measured to find the eye opening with ISI, reflections, and crosstalk including: amplitude errors, timing shift errors, and miscellaneous noise.**
  - **Transmitter driving voltage: +/- 400mV.**
  - **Transmitted Pattern: 2μs of "101010…" training pattern followed by 8μs of random data.**
  - **The equalizer input signals are captured differentially with a Tektronix TDS694C oscilloscope by probing at the backplane.**
  - **The equalizer output signal is generated by Spectre, simulating in transistor level models and using captured data as input stimulant.**

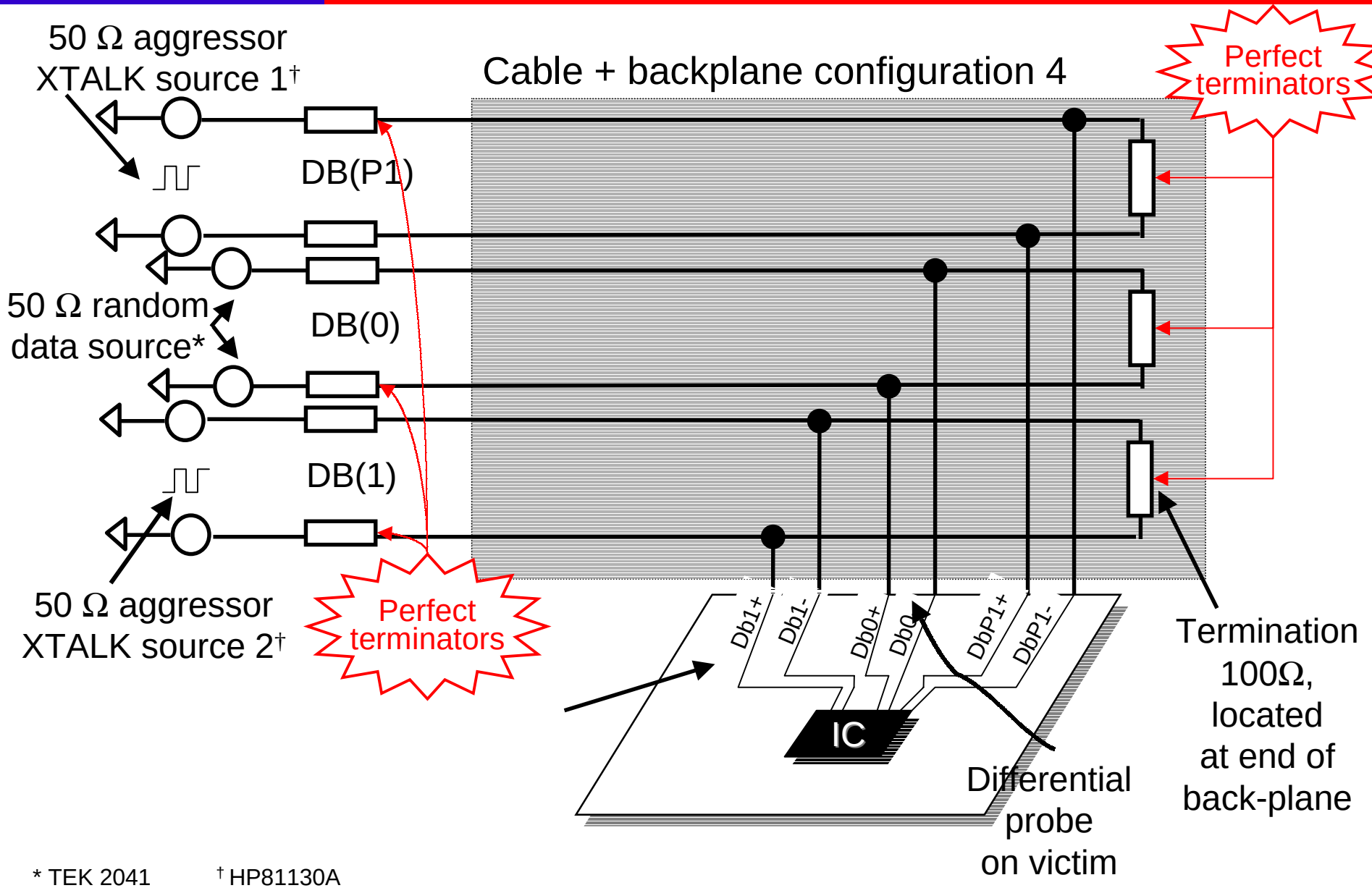
Quantum™ Config 1: Long Cable + Backplane

- **Hitachi 10 meter 32AWG twisted-flat ribbon cable† plus 10-slot backplane.**
- **Waveforms captured @ 4Gigasamples per second.**



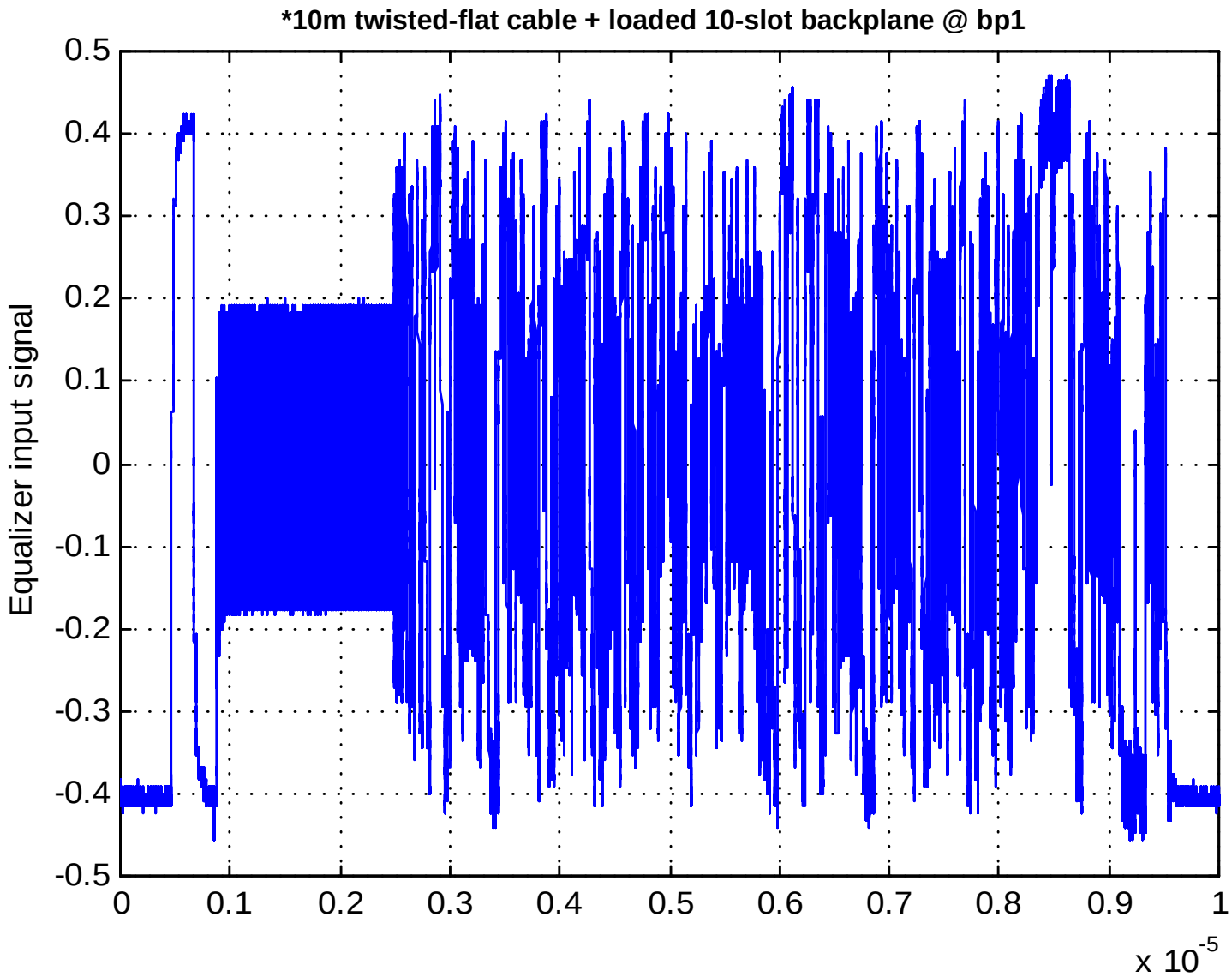
† supplied by Hitachi & Circuit Assembly

Test Schematic

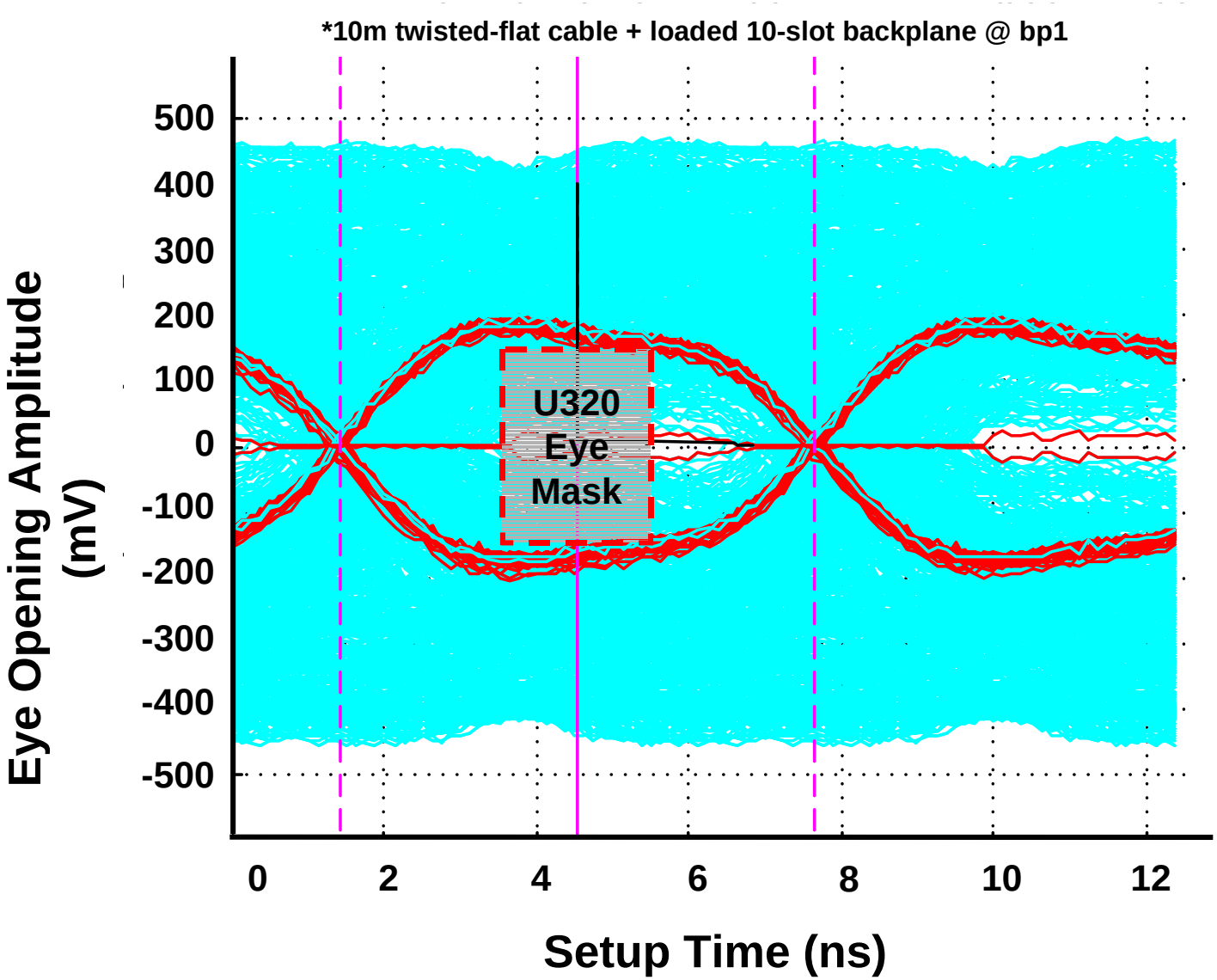


* TEK 2041 † HP81130A

Config 4, No Comp (raw signal)



Config 4, No Compensation



Conclusion: <u>Failing Margin</u>

(Increasing amplitude would still fail)

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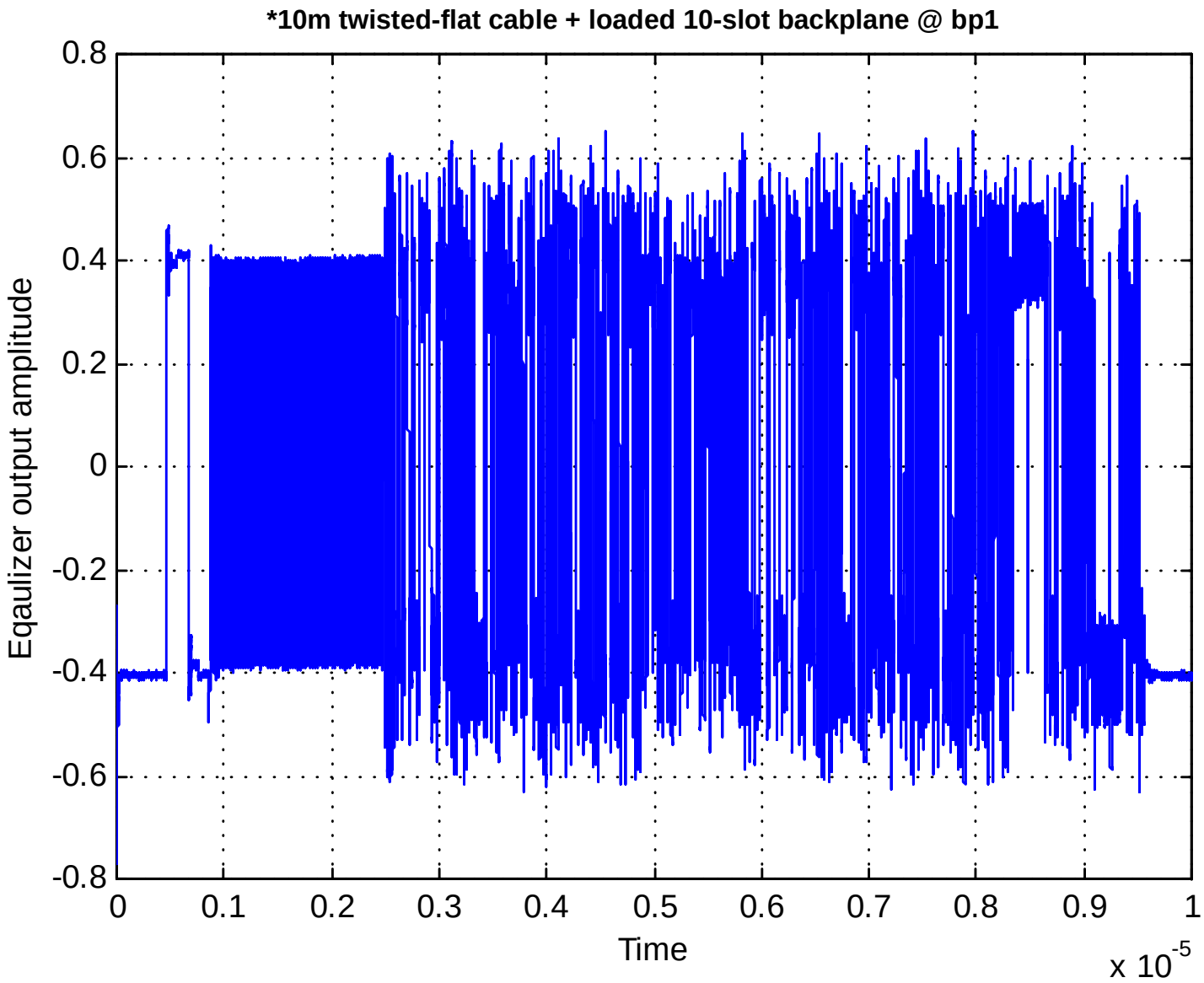
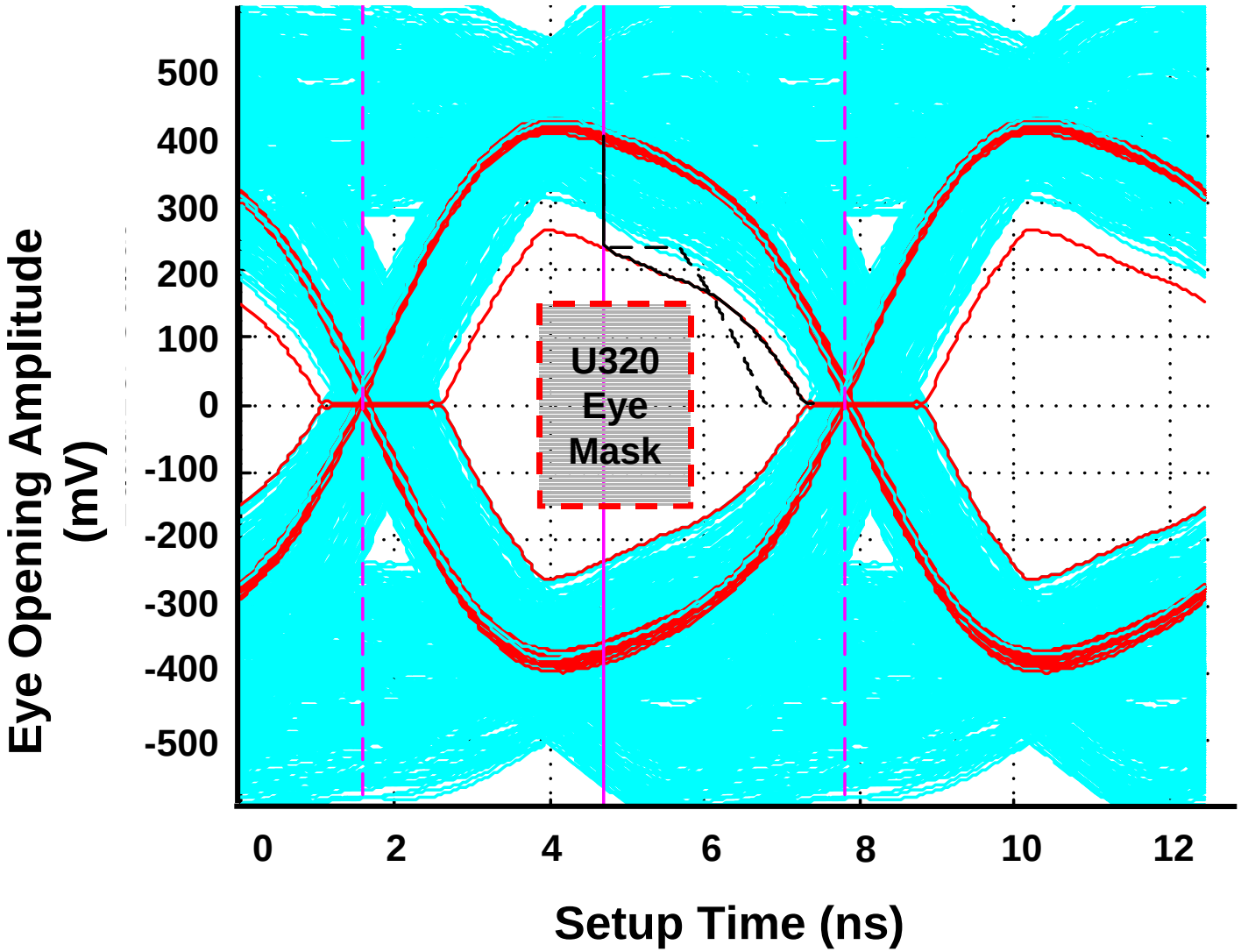
Config 4, RxEq (raw signal)



Config 4, Receiver Equalization

*10m twisted-flat cable + loaded 10-slot backplane @ bp1



Conclusion: <u>Excellent Margin</u>

Margin vs Amplitude for Config 4