Passive SFP at 1.25 GHz

DUT:	Passive SFP
Description:	Passive SFP using Cat6A Cables at 4 Meters
Date of Report:	4/24/08
Written by:	Joon Ahn

Testing Items:

1. Test setup
2. Bit Error Rate Test
3. Eye Pattern Tests
4. Photos

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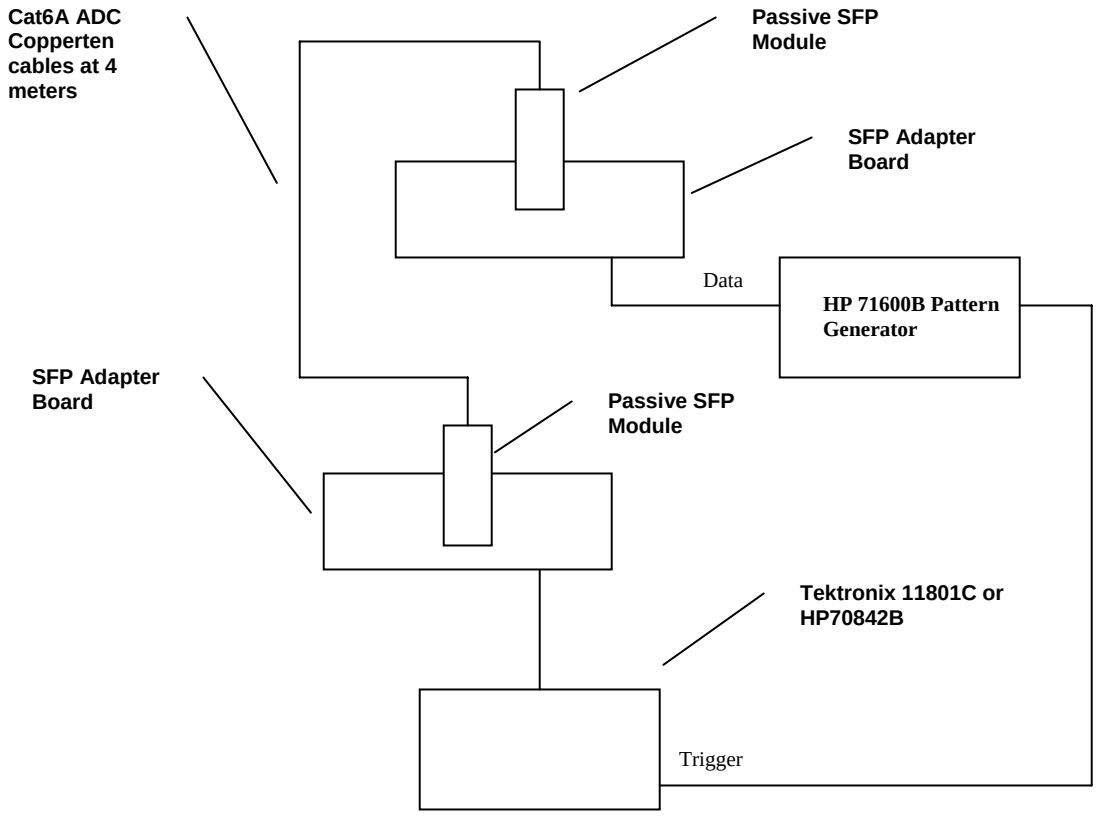
1. Test Setup

Bit Error Rate Setup

- SFP to SMA breakout board
- HP 70842B Error Detector
- HP 71600B Pattern Generator - operated at 1.25 GHz with PRBS 2^7

Eye Pattern Setup

- SFP to SMA breakout board
- Tektronix 11801C with SD-24 module
- HP 71600B Pattern Generator - operated at 1.25 GHz with PRBS 2^7



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Units Under Test

- Use 5 pairs of passive SFP adapters numbered from 1 to 10.
- Use 5 Cat6A Copperten cables from ADC at 4 meters each.

2. Bit Error Rate Test on HP70842B Error Detector
   - Run pattern generator at 1.25Gb/s data rate
   - Run each side of cable and passive adapter pair for 17 minutes
   - The goal is a bit error rate of 1x10E-12.

Passive Pair	4 Meter Cable	Side 1 Bit Errors	Side 1 BER	Side 2 Bit Errors	Side 2 BER
1, 2	1	0	< 1x10E-12	0	< 1x10E-12
3, 4	2	0	< 1x10E-12	0	< 1x10E-12
5, 6	3	0	< 1x10E-12	0	< 1x10E-12
7, 8	4	0	< 1x10E-12	0	< 1x10E-12
9, 10	5	0	< 1x10E-12	0	< 1x10E-12

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3. Eye Pattern from Pattern Generator

- Test parameters per Inifiniband specifications
- Specification: Min eye height 316 mV, min eye width .75UI = .75(800pS) = 600 ps
- Specification: Max Jitter = .25 UI = .25(800ps) = 200 ps
- Input Signal: 1.25 Gbps, 800 mVp-p (up to 1 Vp-p can be used), 2^7 PRBS.
- Waveform: (CH1-CH2), 100 waveforms acquired

Pair	4 Meter Cable	Side 1 Jitter (ps)	Side 2 Jitter (ps)	Side 1 Eye Height (mV)	Side 2 Eye Height (mV)	Side 1 Eye Width (ps)	Side 2 Eye Width (ps)
1, 2	1	78	93	390	380	720	720
3, 4	2	66	96	430	380	750	720
5, 6	3	87	69	400	380	720	720
7, 8	4	99	87	390	400	720	720
9, 10	5	87	87	400	400	720	720

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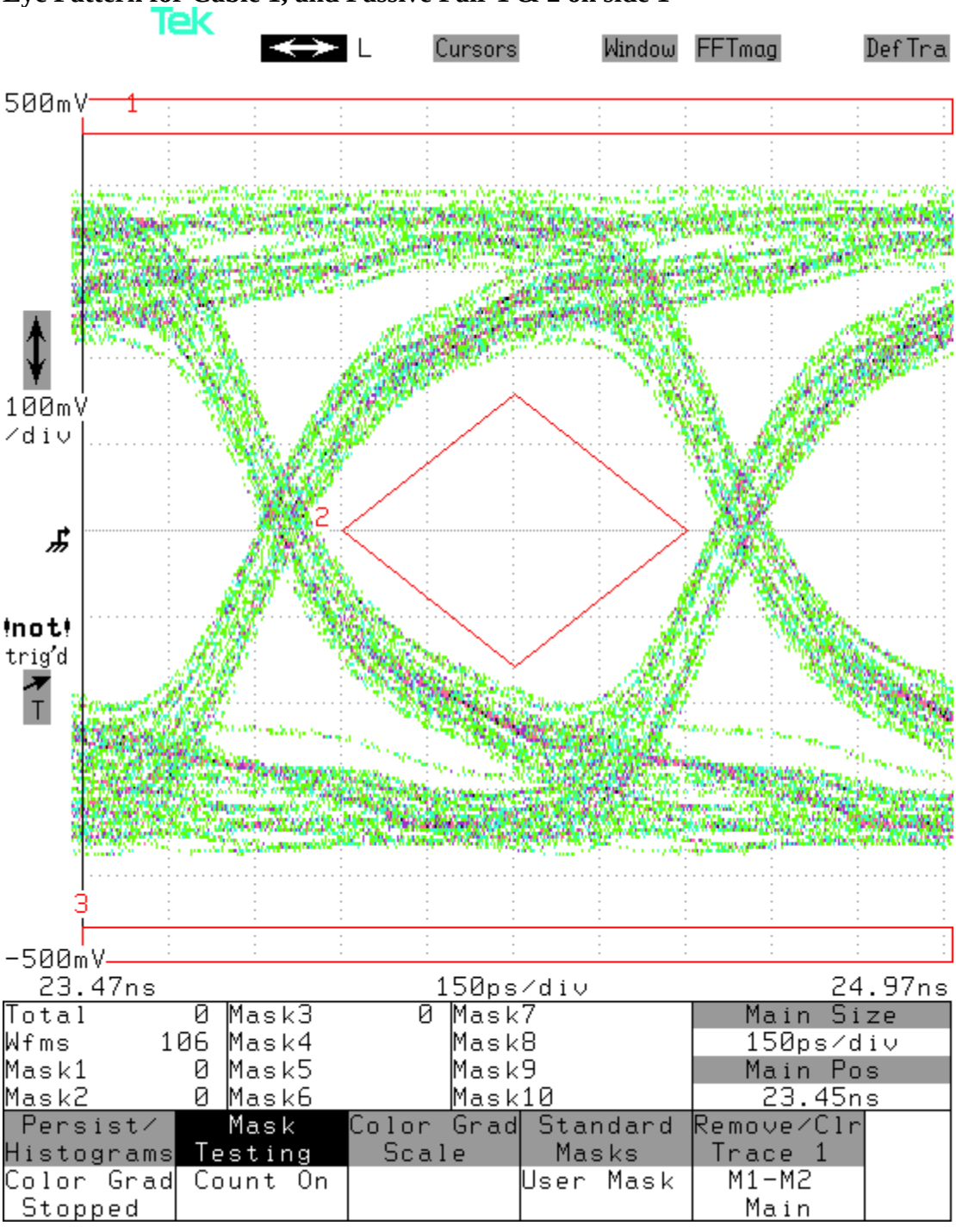
4. Photos

Eye Pattern for Cable 1, and Passive Pair 1 & 2 on side 1



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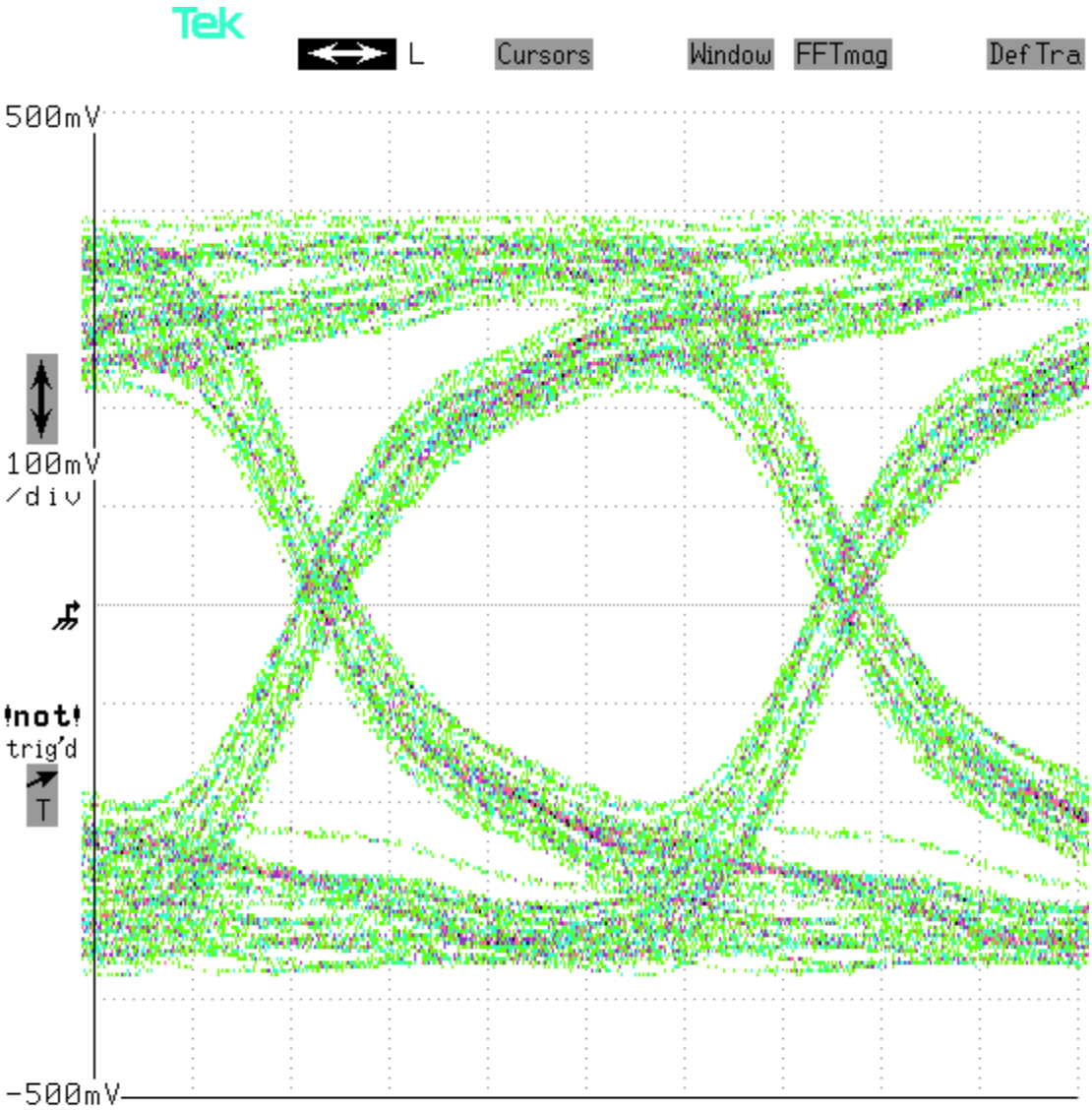
Jitter for Cable 1, and Passive Pair 1 & 2 on side 1



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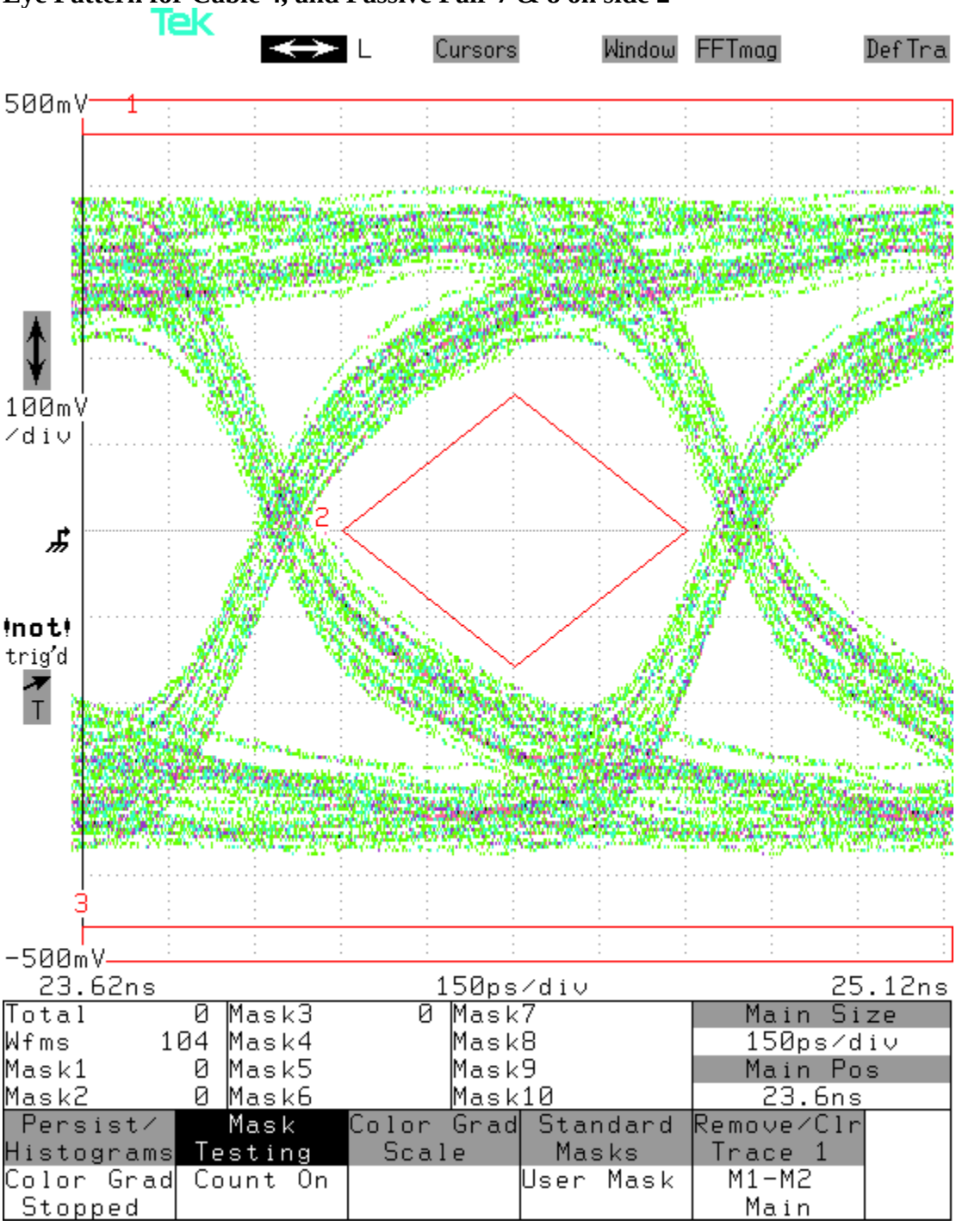
Eye Pattern for Cable 4, and Passive Pair 7 & 8 on side 2



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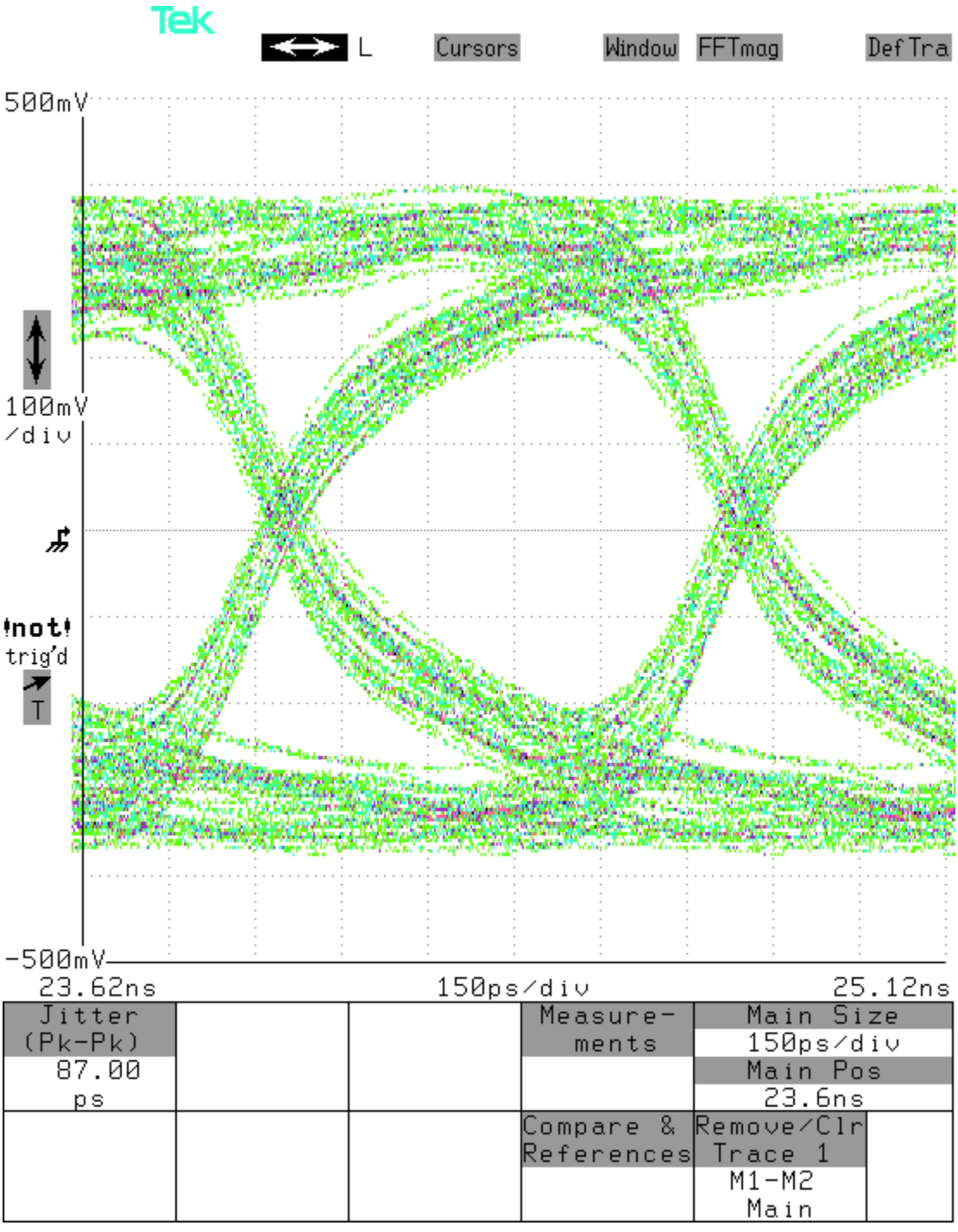
Jitter for Cable 4, and Passive Pair 7 & 8 on side 2



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Conclusion: These tests demonstrate that a reliable Gigabit link can be attained using Passive SFP and Cat 6A cable at relatively short lengths (less than 4M). In an effort to achieve greater distances, with a goal of 5M+, future iterations of the Passive SFP will include an equalization circuit to account for impedance mismatches and an optimized board mount Modular Jack to minimize crosstalk. The availability of this improved version is expected to be mid/late May 2008.

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