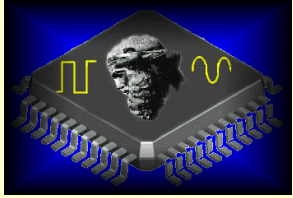


Plato Labs, Inc.

10 Gb/s PMA Architecture for Copper
Medium
IEEE 802.3ae Interim
May 2000
Ottawa ON.

JOSEPH N. BABANEZHAD

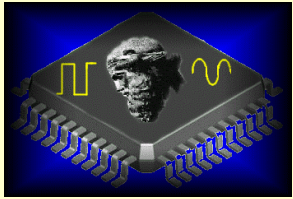
PLATO LABS
CAMPBELL, CA.



Plato Labs, Inc.

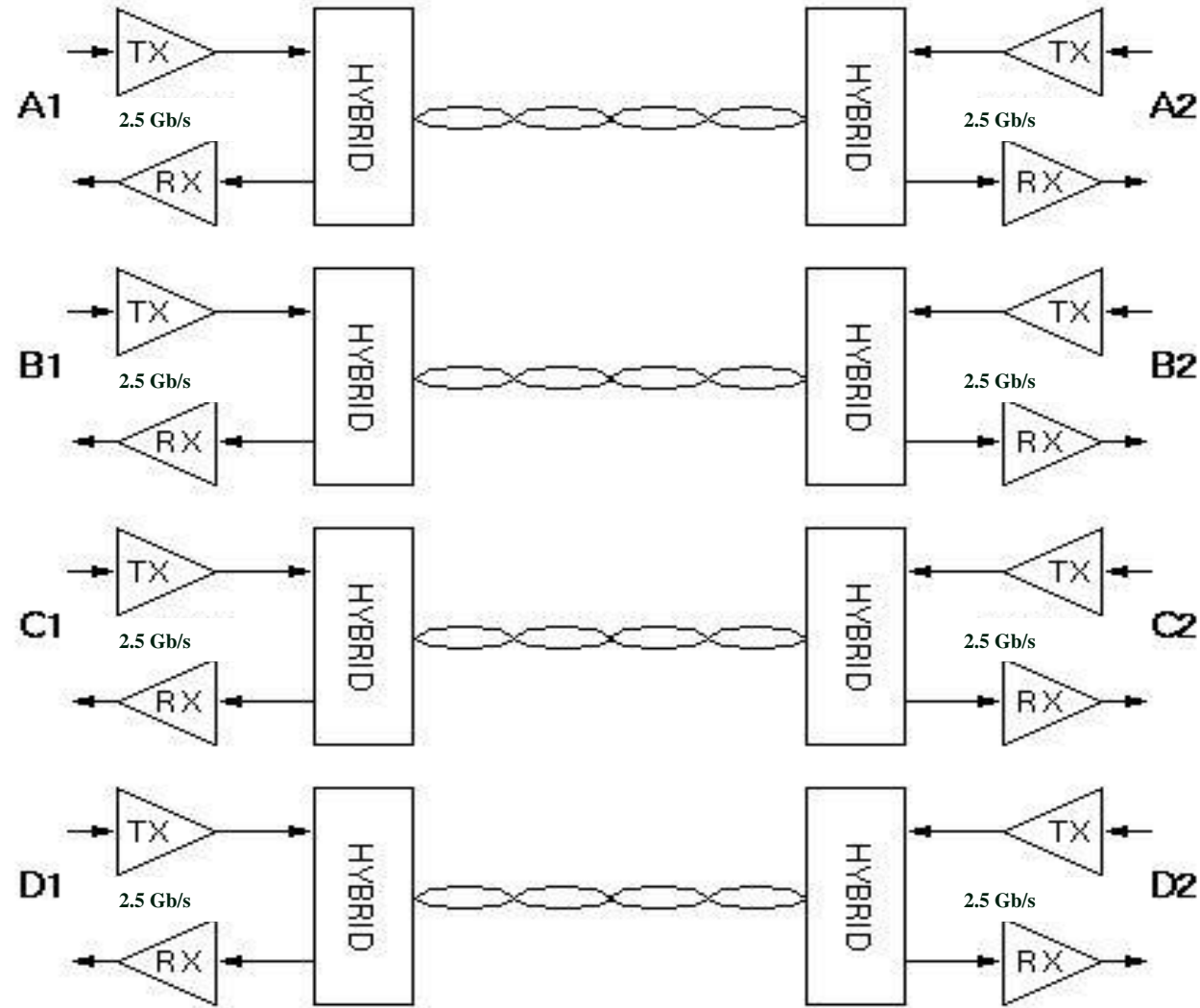
10 Gb/s Copper Solution

- ▼ 10 Gb/s over fiber is the right solution for long-haul.
- ▼ For short-haul (jumper cable in closet/server room), 10 Gb/s over copper (Coax) is more cost effective.

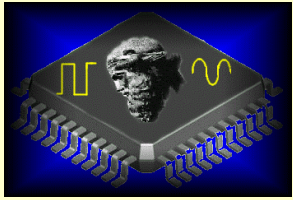


Plato Labs, Inc.

10 Gb/s Communication over 4-Pair



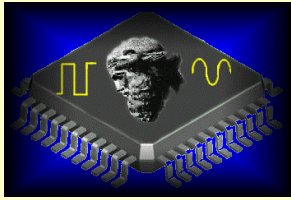
10 Gb/s Architecture



Plato Labs, Inc.

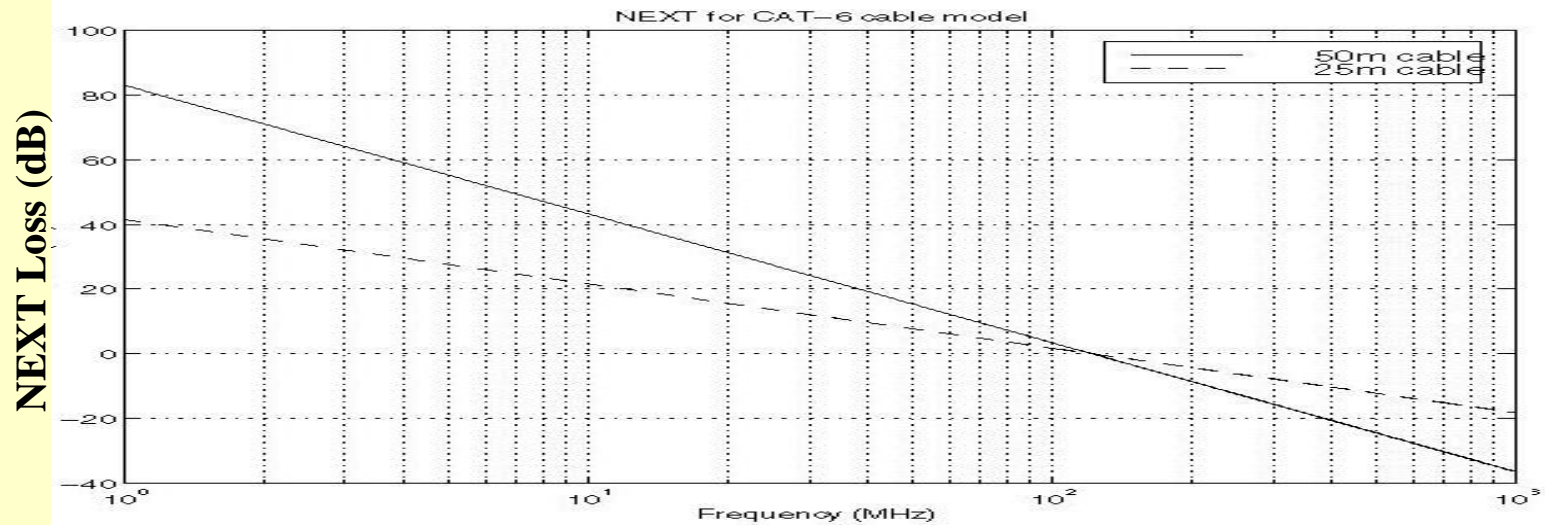
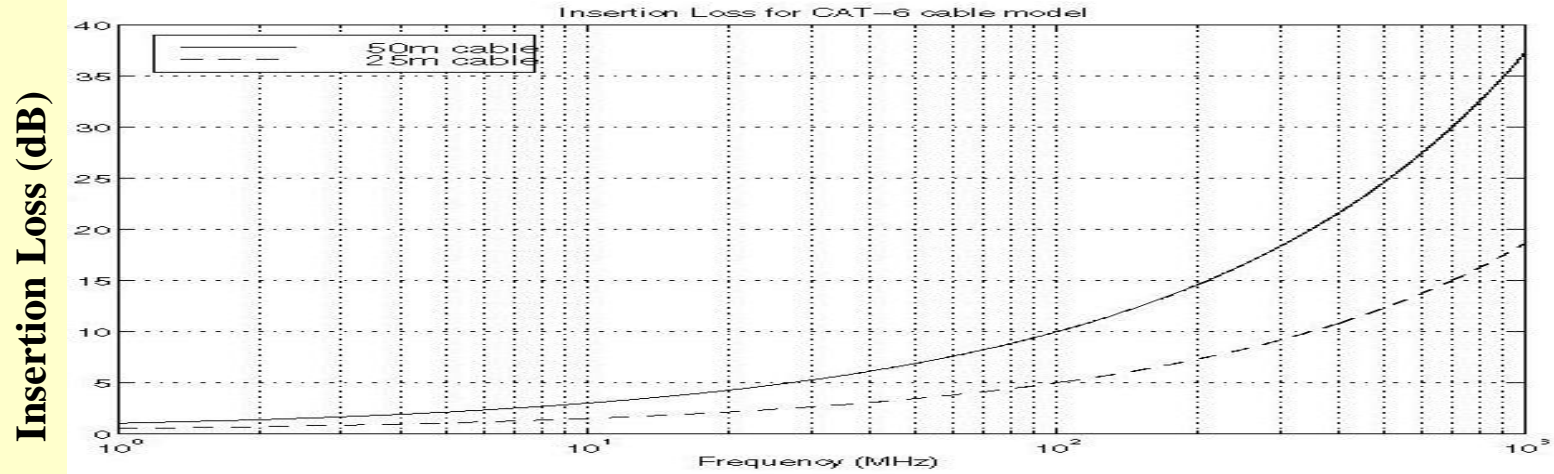
10 Gb/s Architecture Attributes

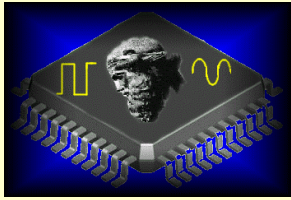
- ✓ 1000BASE-T running at 10x the speed
- ✓ Each transceiver unit is running at 2.5Gb/s full-duplex (min. pulse-width 800ps)
- ✓ Efficient use of copper medium
- ✓ Can be applied to Coax and UTP (CAT6)
- ✓ PAM5 signaling
- ✓ Needs Echo and NEXT canceler



Chris DiMinico's Insertion & NEXT Loss Model

Plato Labs, Inc.



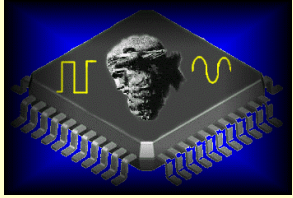


Plato Labs, Inc.

Jitter vs. Equalized B/W (Cable + Equalizer)

Order	f_{-3dB} (GHz)	Peaking (dB)	Jitter * (UI)
1st	1	-	0.025
1st	0.8	-	0.16
1st	0.53	-	0.44
2nd	1.4	0.9	0.16
2nd	1.23	2.1	0.32
2nd	1.3	5.1	0.50

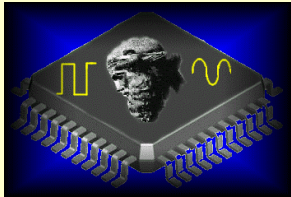
* 400ps min. MLT3 pulse-width



Plato Labs, Inc.

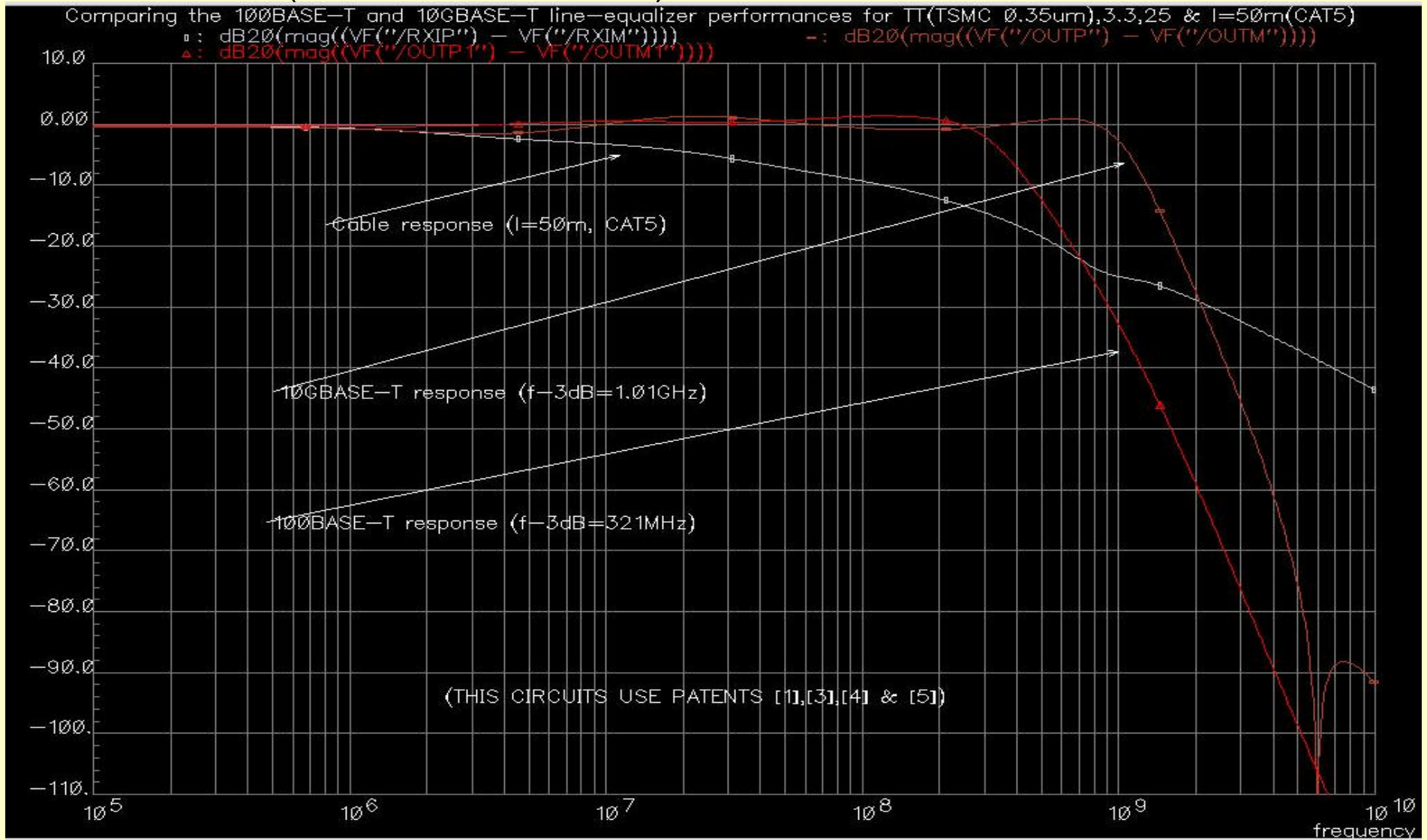
Simulation Results

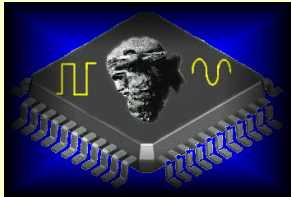
- ▼ Results of transistor-level simulation from early works based on 400ps MLT3 over CAT5.



10 Gb/s Adaptive Line-Equalizer performance

Plato Labs, Inc. (0.35 μm , 50m CAT5)

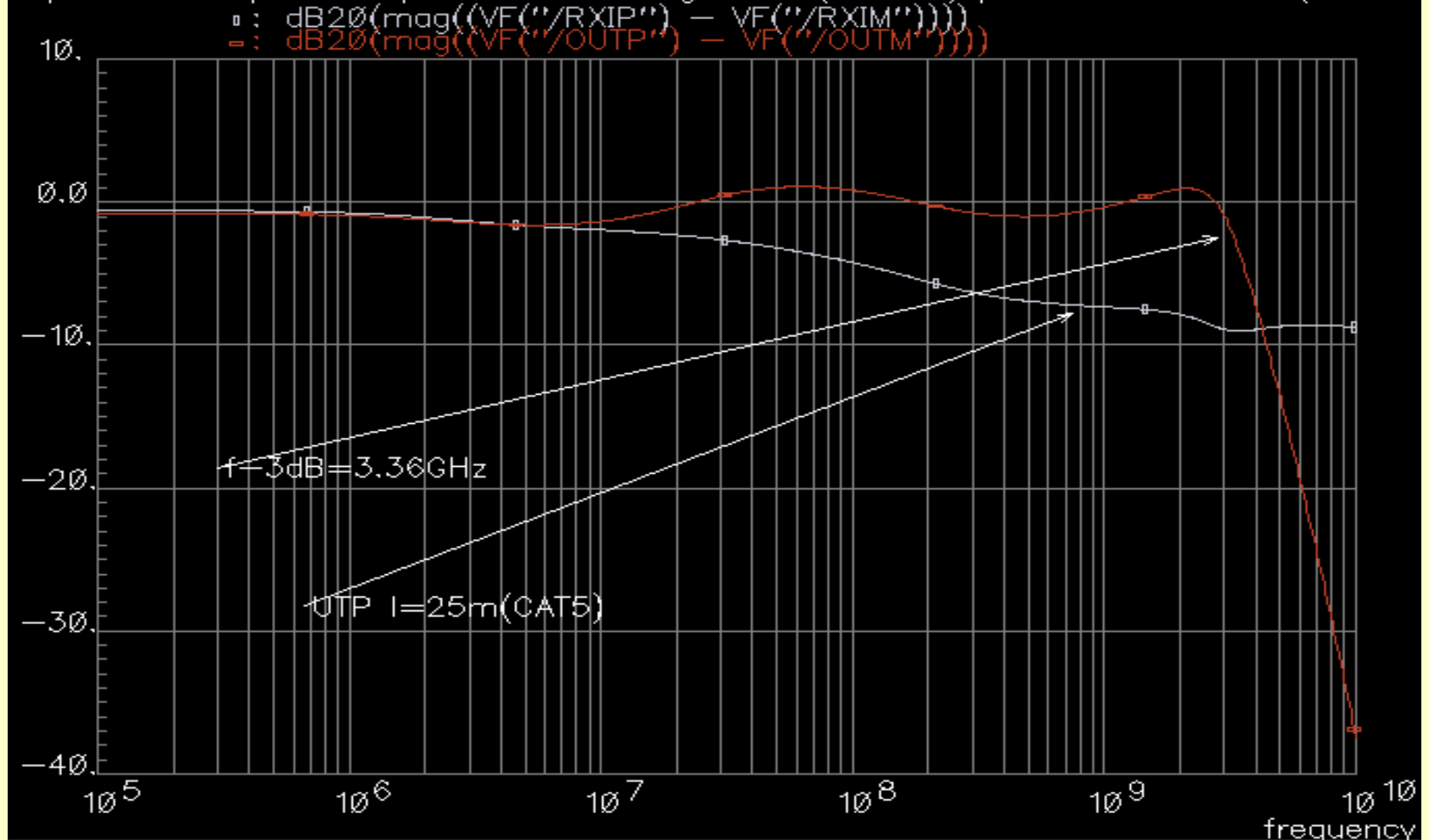


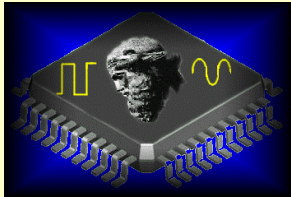


10 Gb/s Adaptive Line-Equalizer performance

Plato Labs, Inc. (0.18 μm , 25m CAT5)

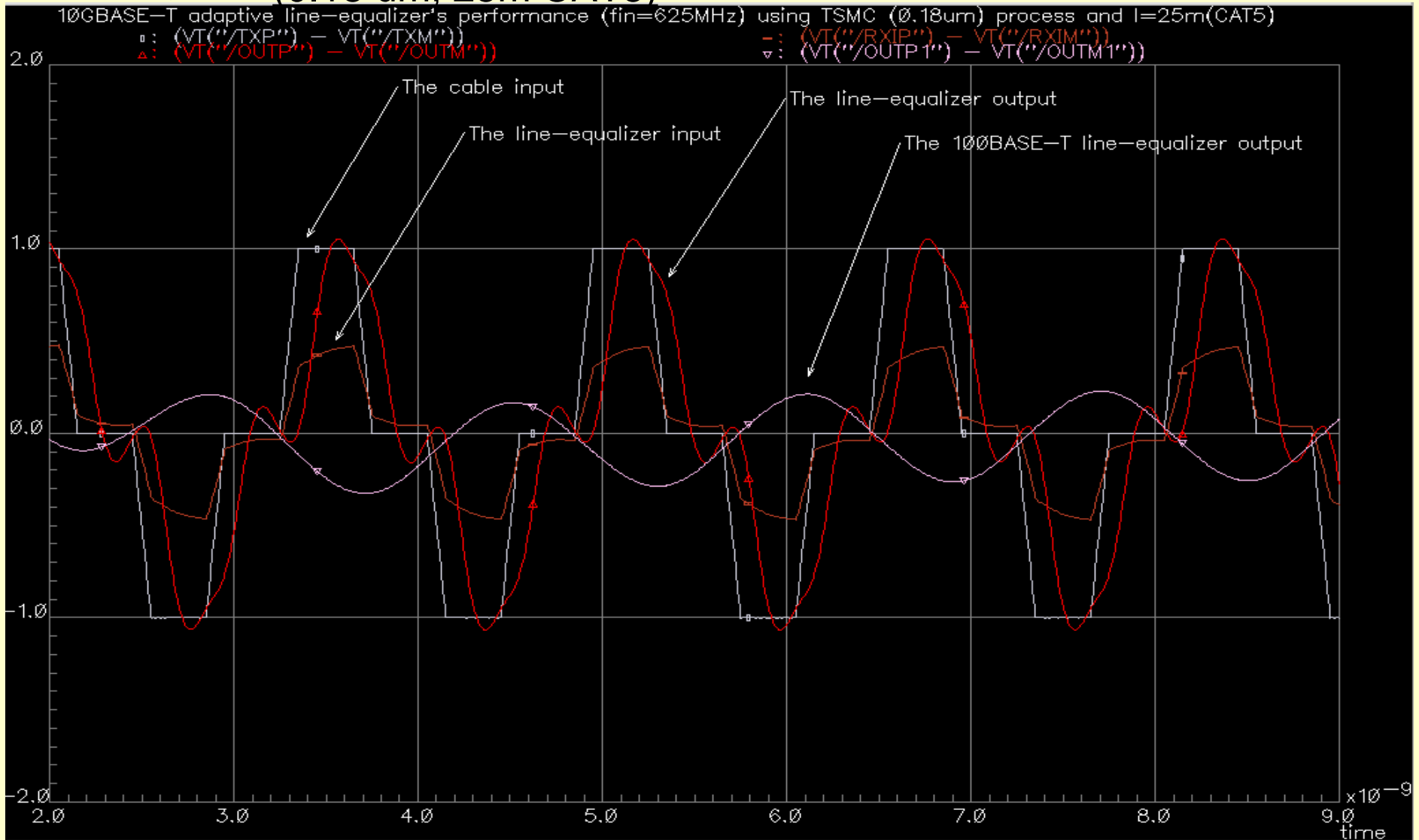
adaptive line-equalizer's performance using TSMC (0.18 μm) process and I=25m(CAT5)

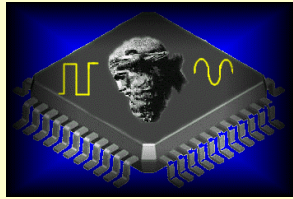




10 Gb/s Adaptive Line-Equalizer performance

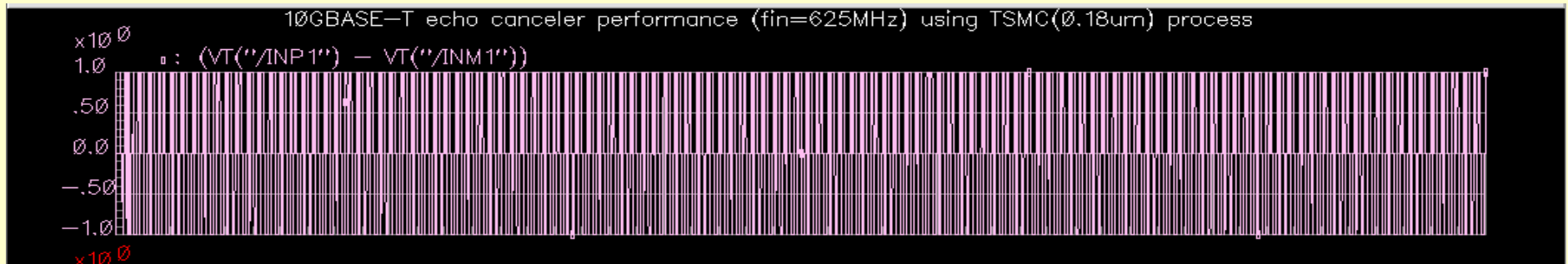
Plato Labs, Inc. (0.18 μm , 25m CAT5)

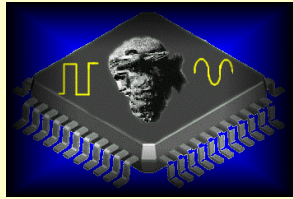




Plato Labs, Inc.

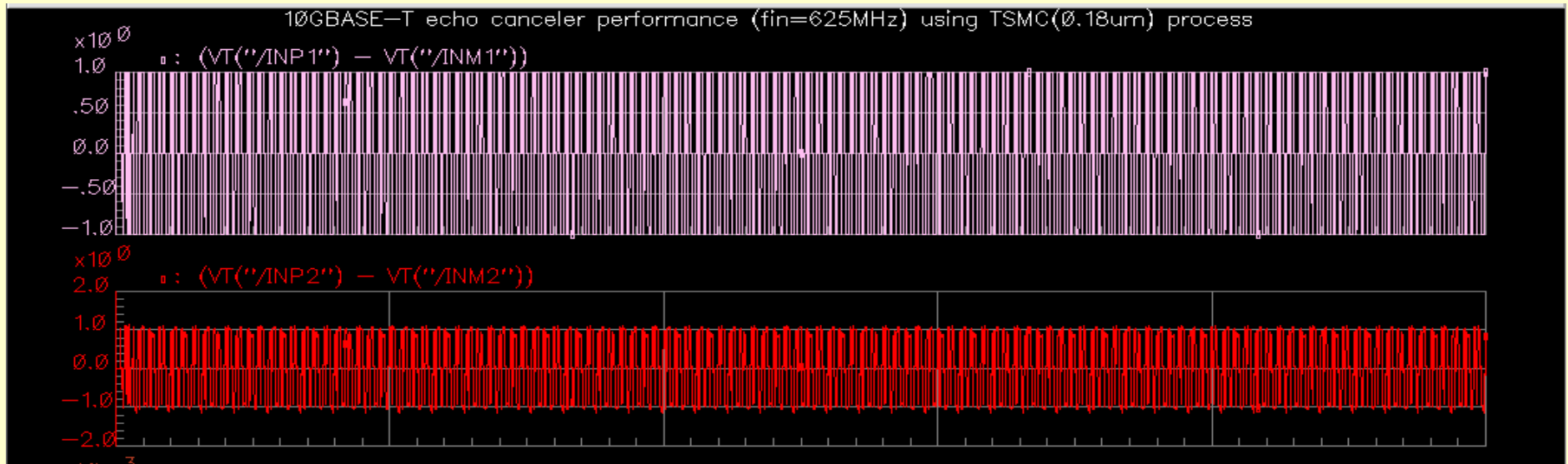
10 Gb/s Echo Canceler performance, TX Out (0.18 um, 25m CAT5)

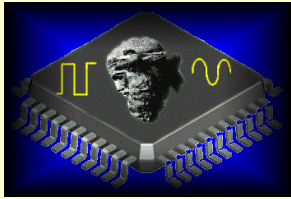




10 Gb/s Echo Canceler performance, RX w/ Echo

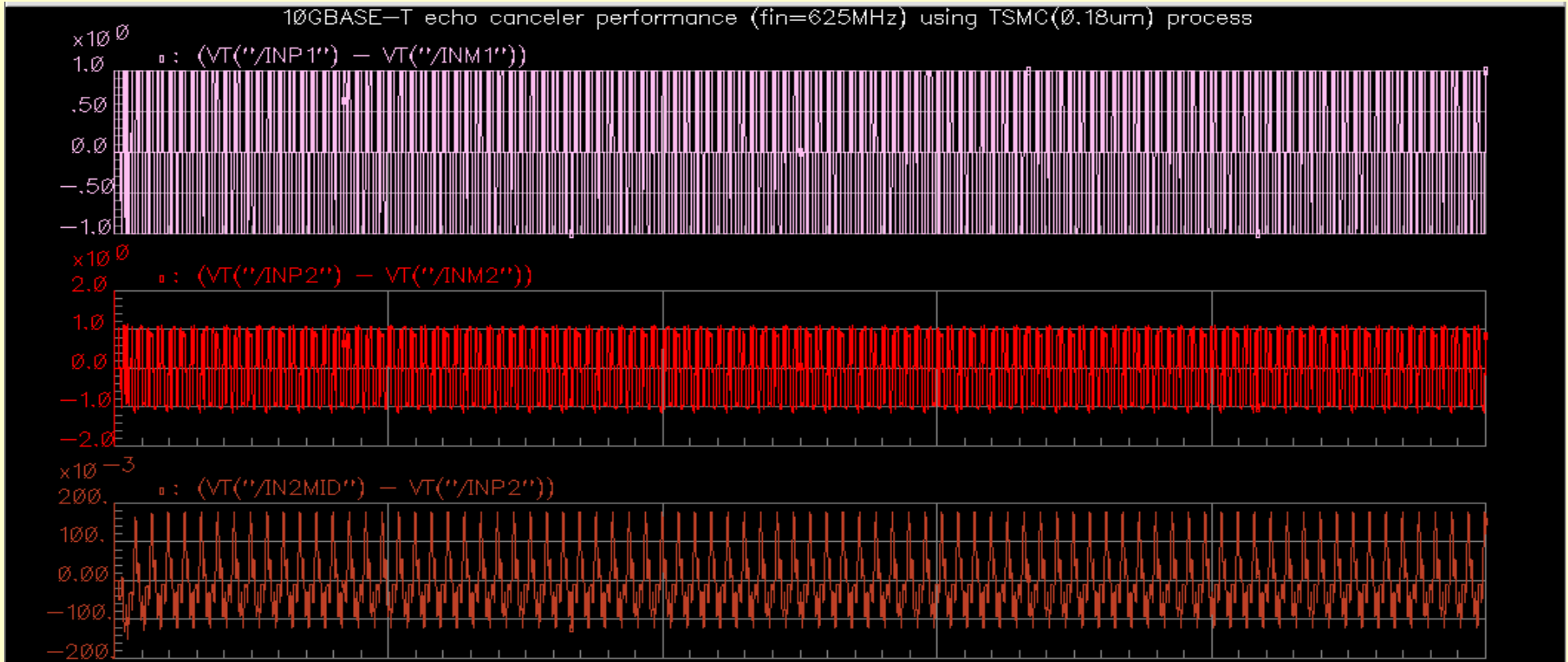
Plato Labs, Inc. (0.18 μm , 25m CAT5)

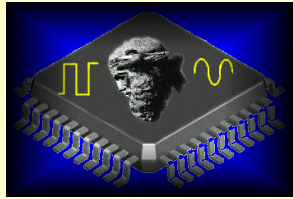




10 Gb/s Echo Canceler performance, RX w/o Echo

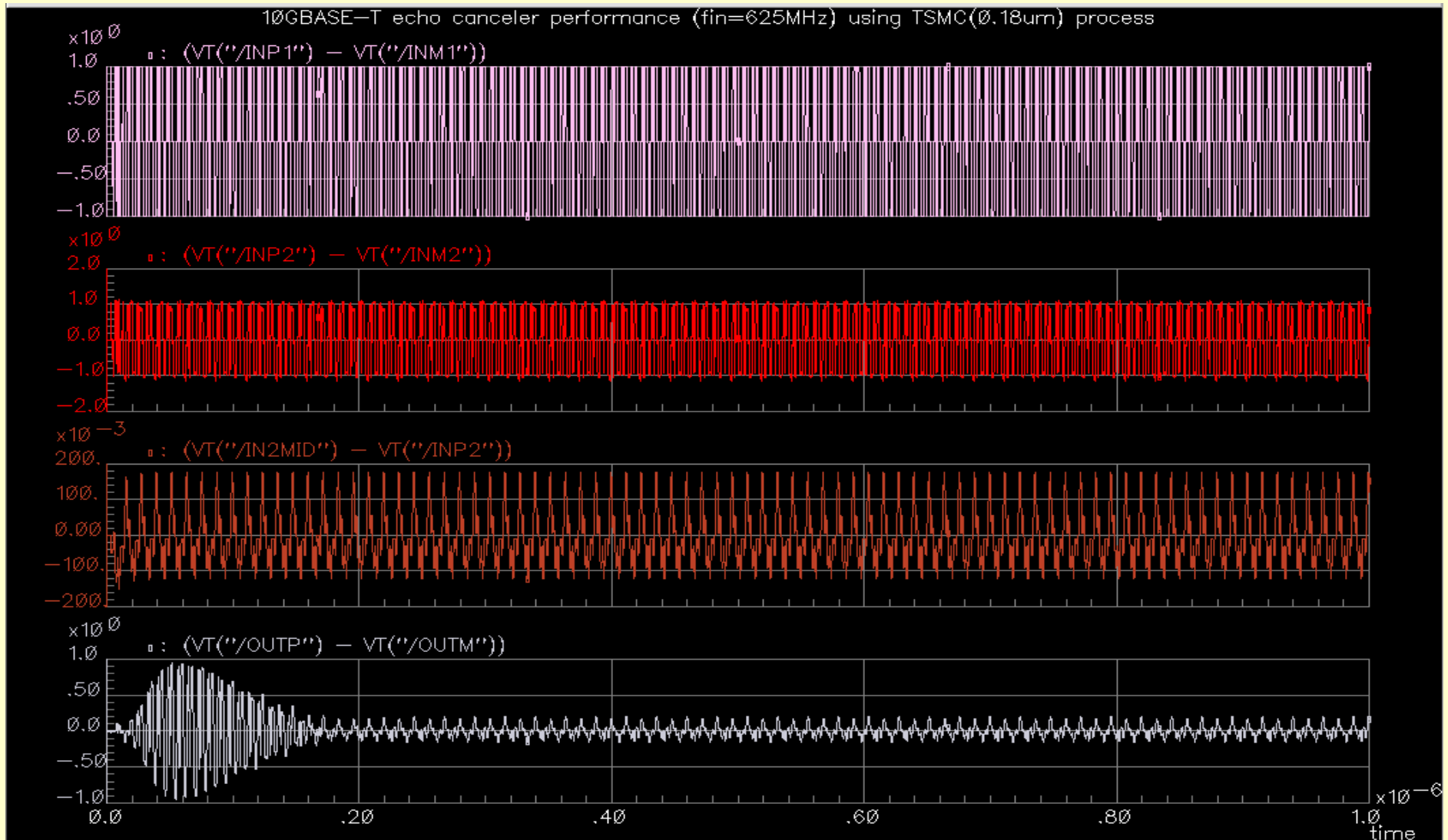
Plato Labs, Inc. (0.18 μm , 25m CAT5)

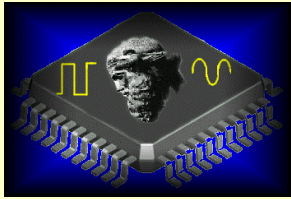




Plato Labs, Inc.

10 Gb/s Echo Canceler performance, Echo Canceler output, (0.18 um, 25m CAT5)





Plato Labs, Inc.

10 Gb/s Echo Canceler performance, Echo Canceler output, (0.18 um, 25m CAT5)

