



# 2011 Flash Memory Summit Presentation

David Eggleston, CEO

August 10, 2011

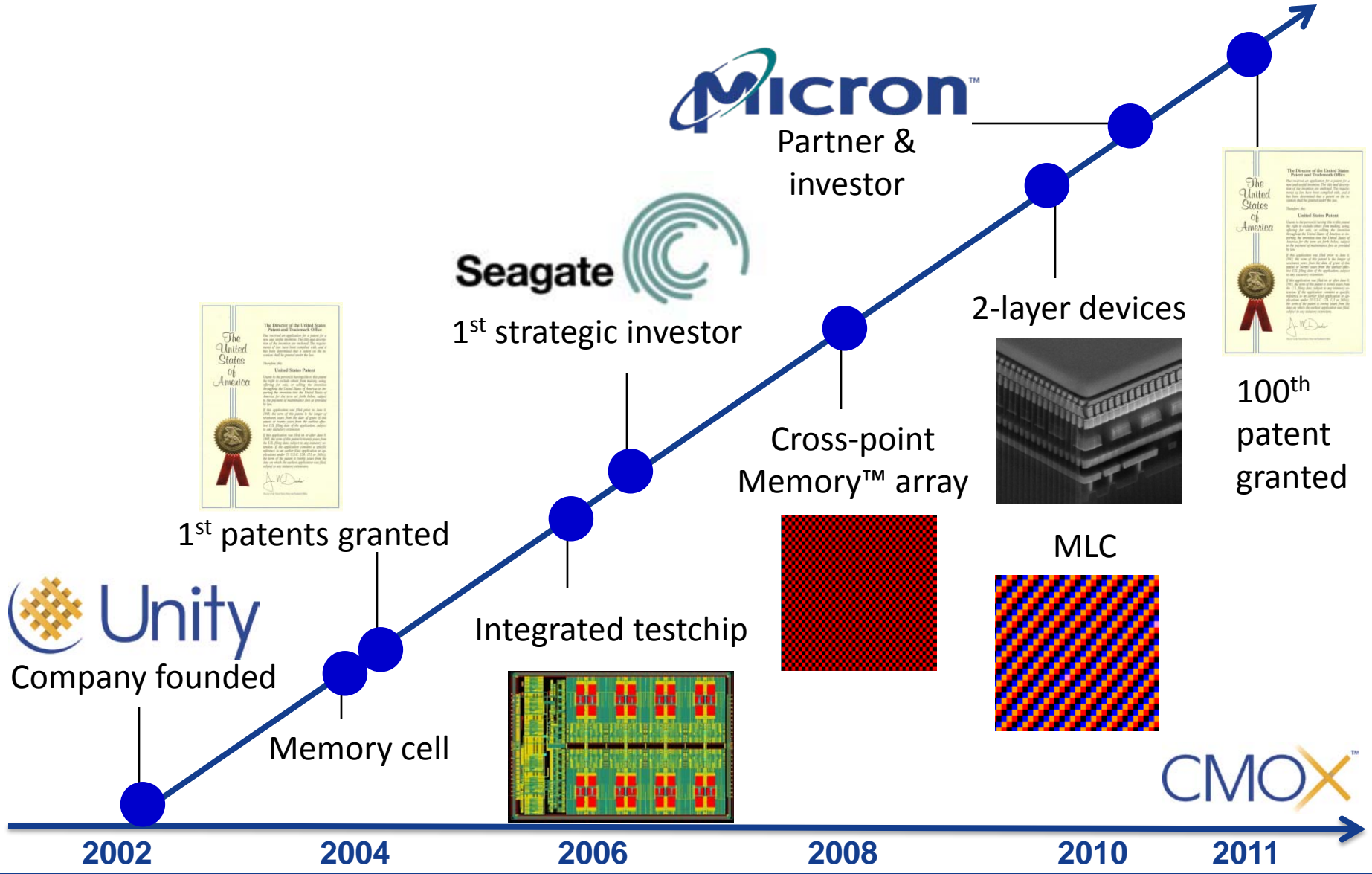
# Who we are

## Company Overview

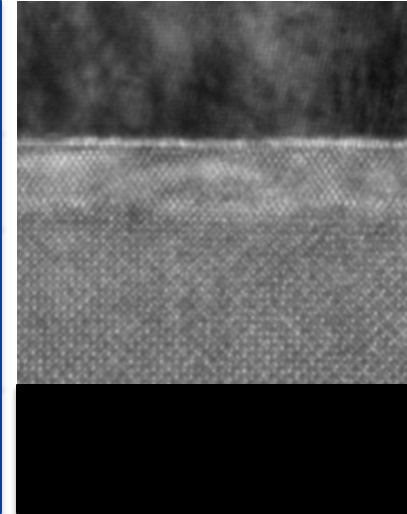
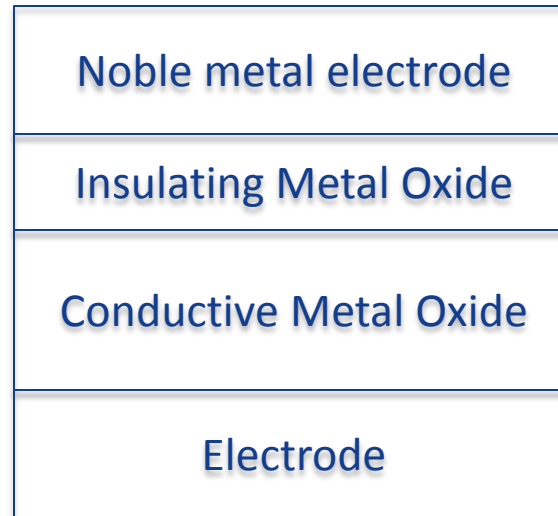
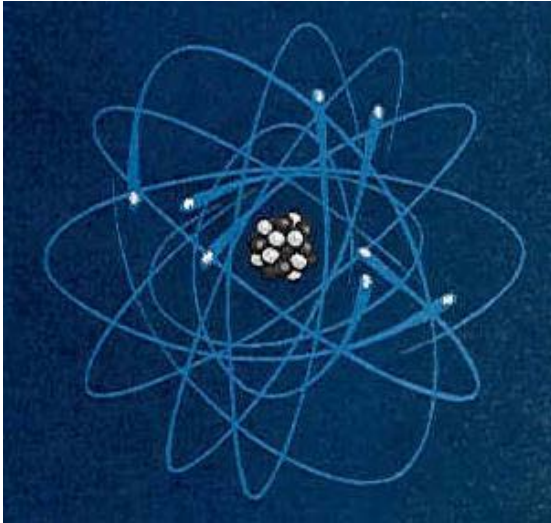
Founded:	2002
Technology:	CMOx Cross-point Memory™ is a replacement for high density NAND  Physics of Oxygen movement enables our devices
Development:	2-year JDP with Micron
Patents:	IP protected by more than 108 granted patents
Our business model:	<ul style="list-style-type: none"><li>•IP licensing</li><li>•Specialty product sales</li></ul>
Corporate backers:	



# Timeline



# CMOx™ Memory Cell



**CMOX™**  
The power of  
Oxygen

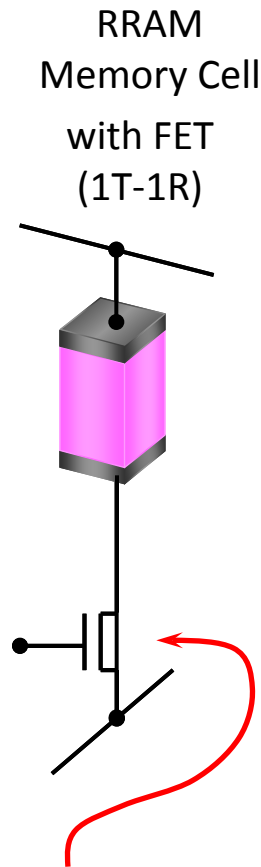
Moving Oxygen in and out of thin films  
under electric field control enables CMOx™  
to scale to 10nm and beyond

CMOx™ uses Oxygen physics to surpass NAND.

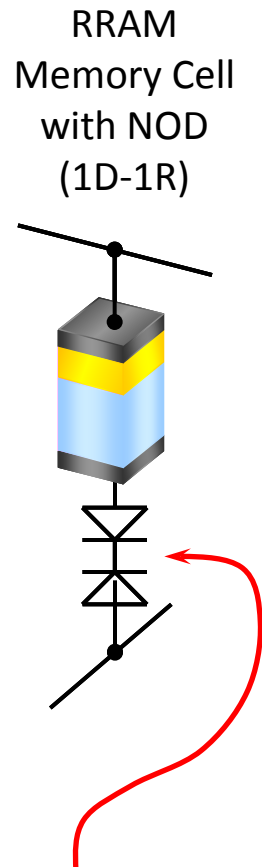
# Where is the Select Device?

Two terminal memory cells are severely limited by stray currents. Some type of select device must be used.

Extra select devices (1T or 1D) add complexity or cell area.

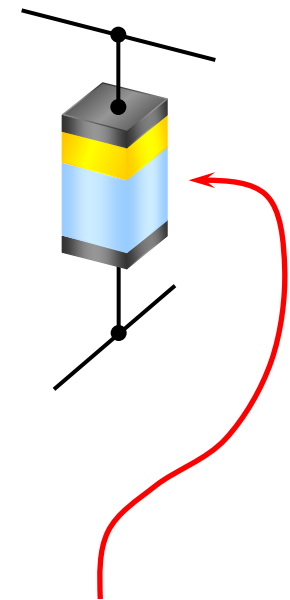


FET in Bulk CMOS layers. Cell size limited by FET layout.



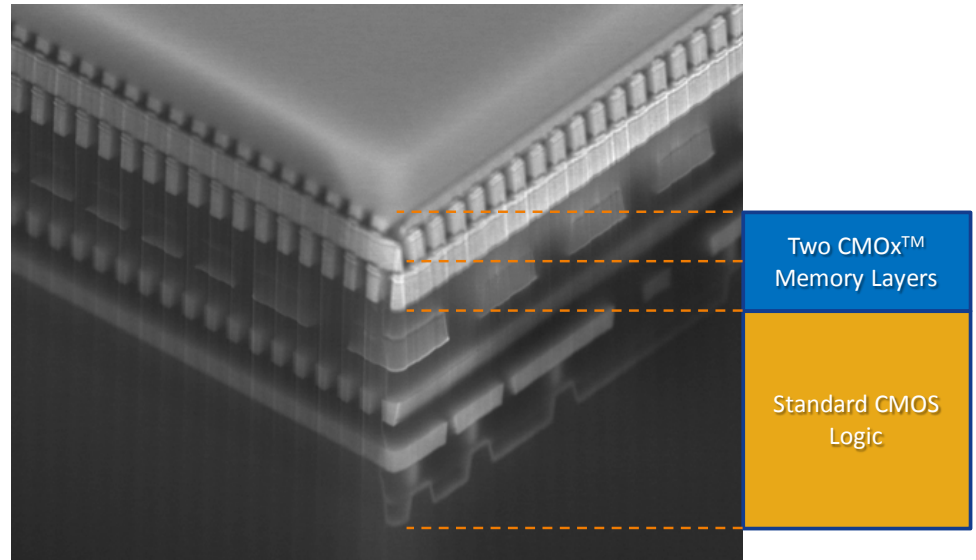
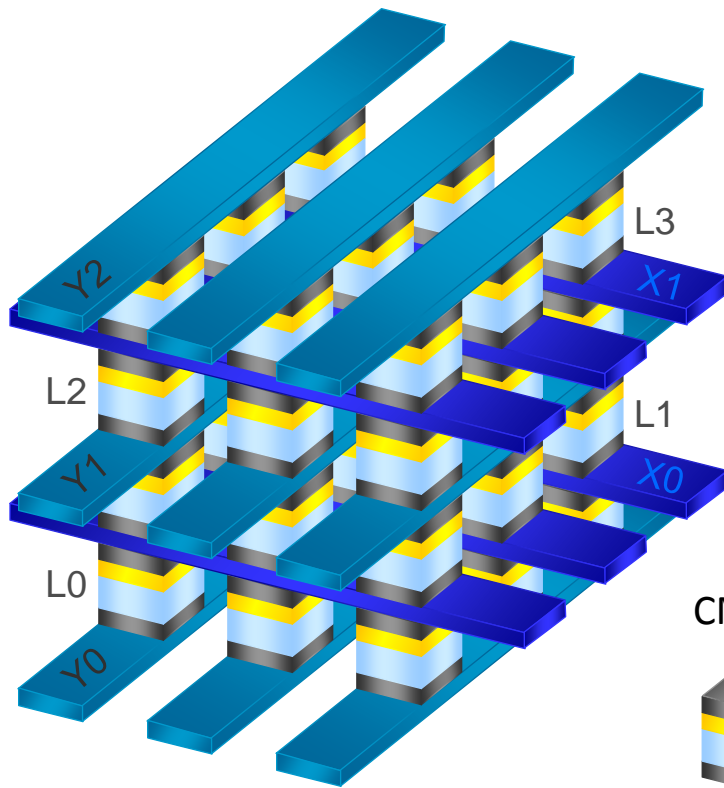
Non-Ohmic devices (diode-like) in cell stack. A suitable NOD has yet-to-be produced.

CMOX<sup>™</sup>  
(1R)



Select device is engineered directly into the CMOX<sup>™</sup> cell. A true 1R memory cell.

# Multi-Layer CMOx™



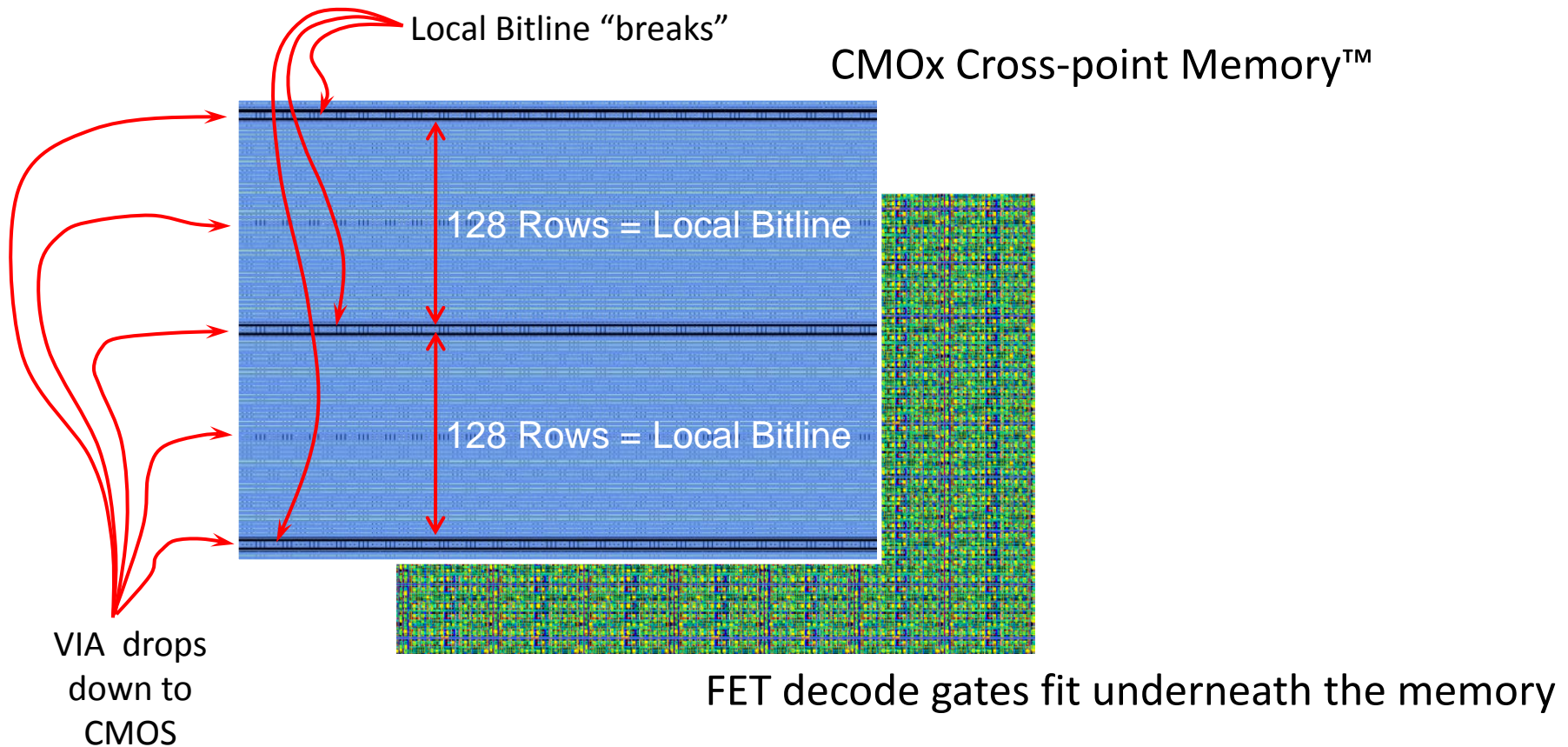
Two layer actual test chip

CMOx™ Memory Cell



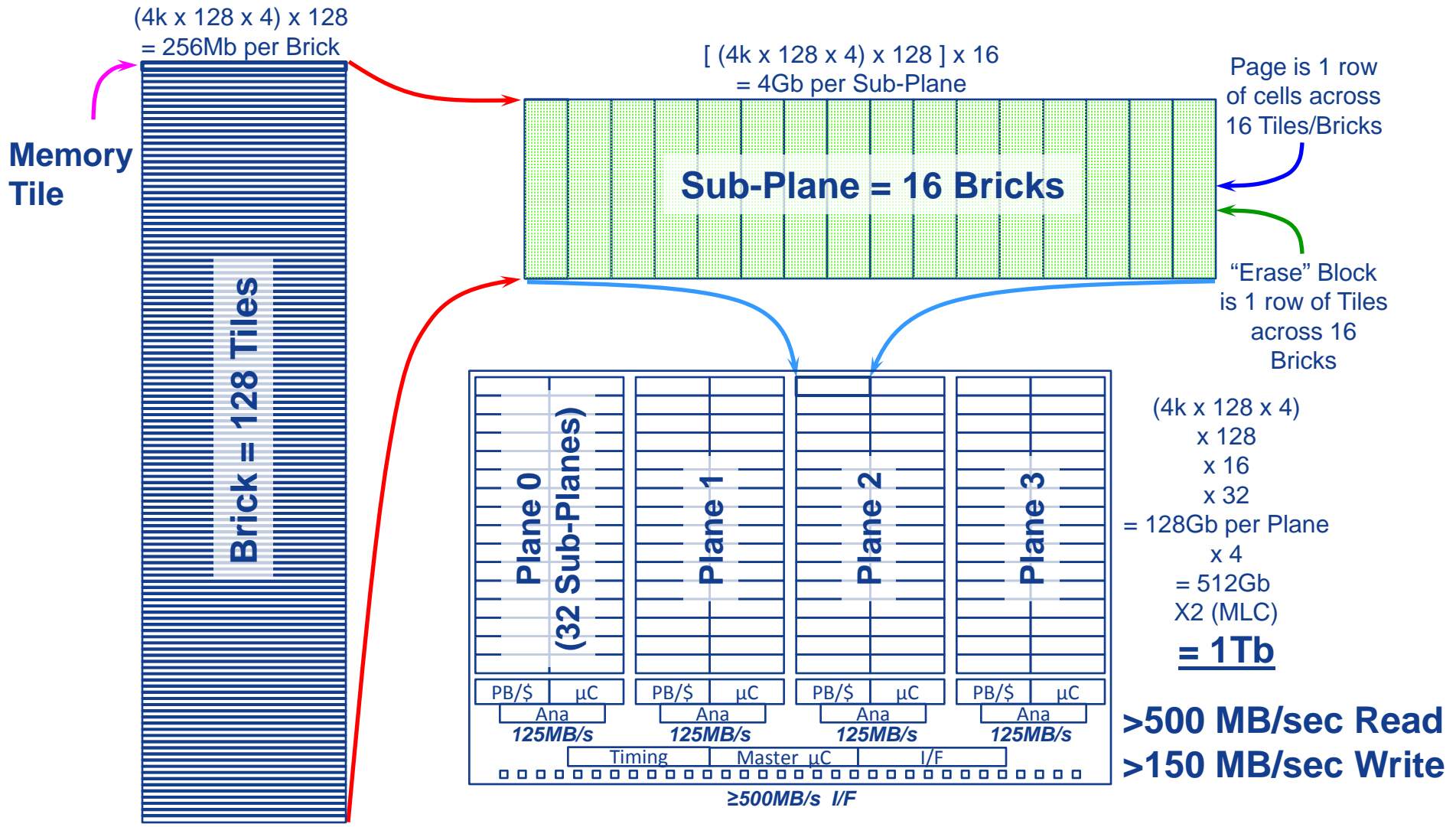
Four layers of CMOx™ are planned for commercialization.

# CMOx™ Memory Tile



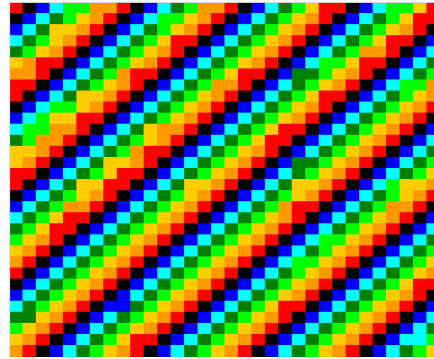
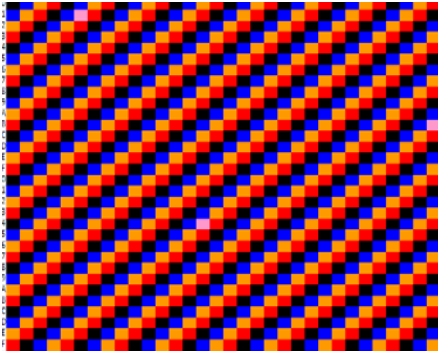
Unity's patented CMOx™ Memory Tile achieves maximum array efficiency.

# 1Tb Storage Chip Architecture

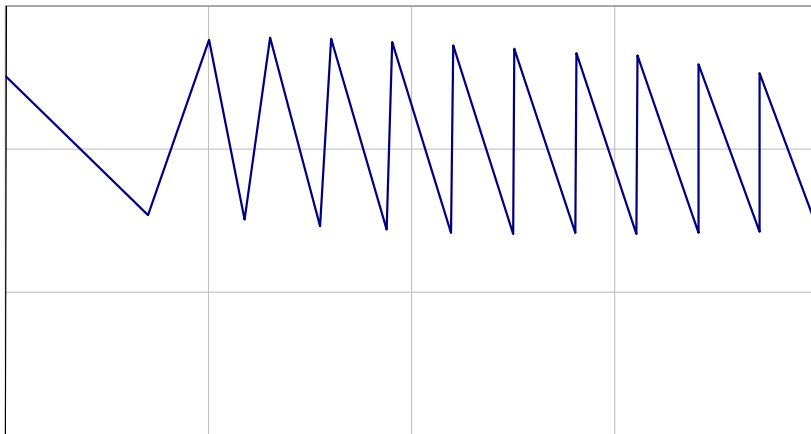




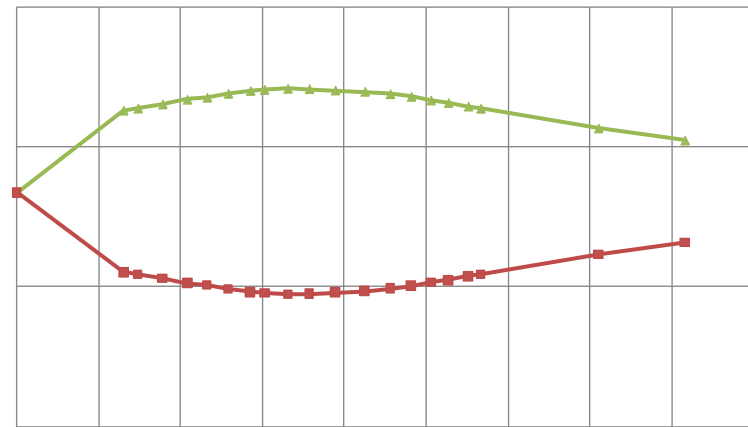
# CMOx™: Demonstration



- MLC/TLC write & read achieved in a true 1R cross-point memory



Cycling



Data Retention

— Erase  
— Program

- >10K write cycles with uniform switching

- 5 year data retention

# Competitive Environment

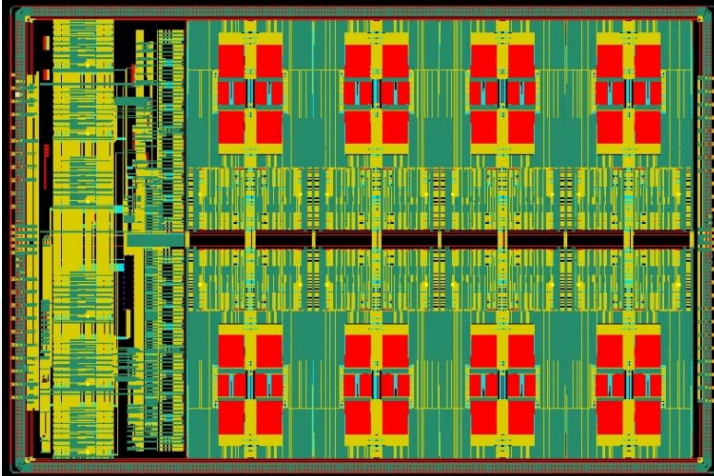
## Unity Well Positioned

	Density	Speed	Reliable	Low Cost	Replaces
CMOX™	●	◐	◑	●	NAND
Phase Change	◐	◑	●	◐	NOR
MRAM	○	●	●	○	DRAM
RRAM	◑	◐	◐	◑	NAND
Memristor	◑	◐	◐	◐	Logic?

# What We Offer Licensees



Process technology transfer



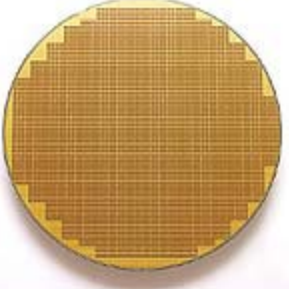
Reference design



Access to Unity Engineers



Patent license



Device scaling expertise

Unity offers a comprehensive bundle of IP and engineering know-how to licensees.

# Summary

- We designed, architected and patented a transistorless memory cell that we fabricate into ultra dense cross-point arrays.
- CMOx Cross-point Memory™ is engineered to replace NAND.
- Our Micron joint development program is scaling CMOx™ in a state-of-the-art 300mm fab using industry standard tools.
- CMOx Cross-point Memory™ will come to market through our licensing and technology transfer to memory semiconductor companies and through specialty chips we sell directly.



Unity  
Cross-point Memory



Technology for Terabits