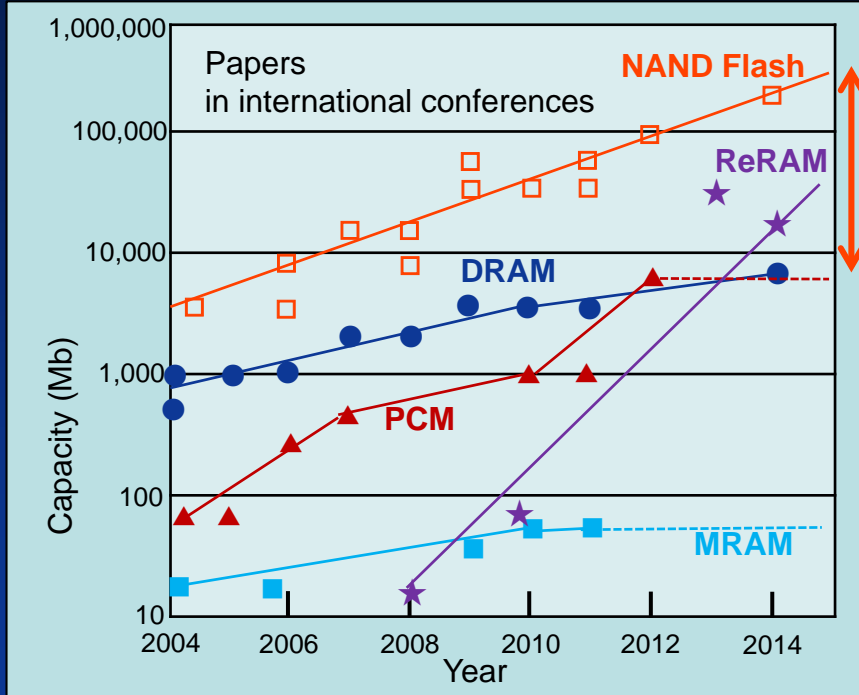


ReRAM Technology Perspective

Amigo Tsutsui
Sony Corporation

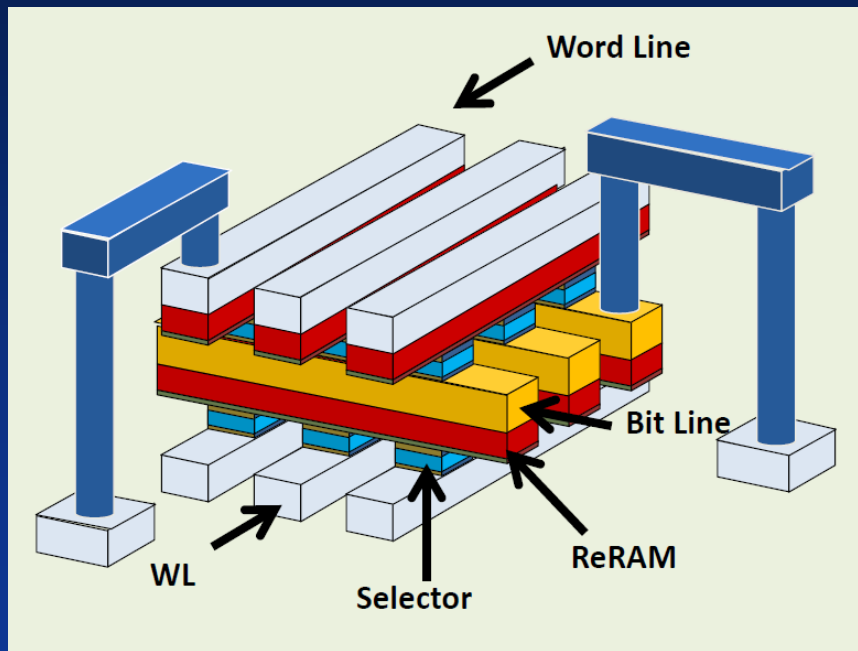
SCM is between NAND and DRAM



Emerging Memory Technologies

- MRAM is far from the target
- PCM looks like less improvement
- ReRAM is newcomer to grow up
- ReRAM is powerful candidate
- Need more capacity for the future

Cross Point for Higher Capacity



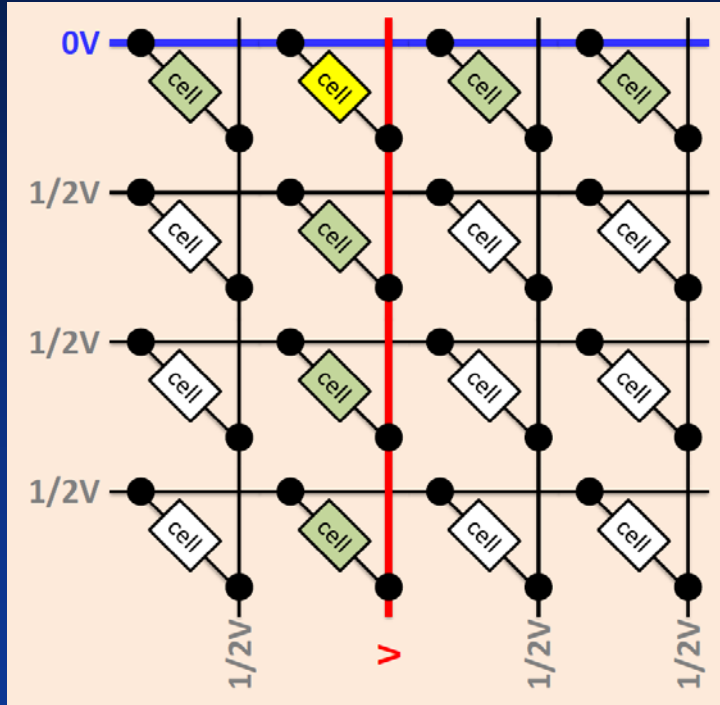
The key: Selector and Integration

- CP R&D has long history
- But still under R&D



What are essential challenges?

Big Array of Cross Point Chip

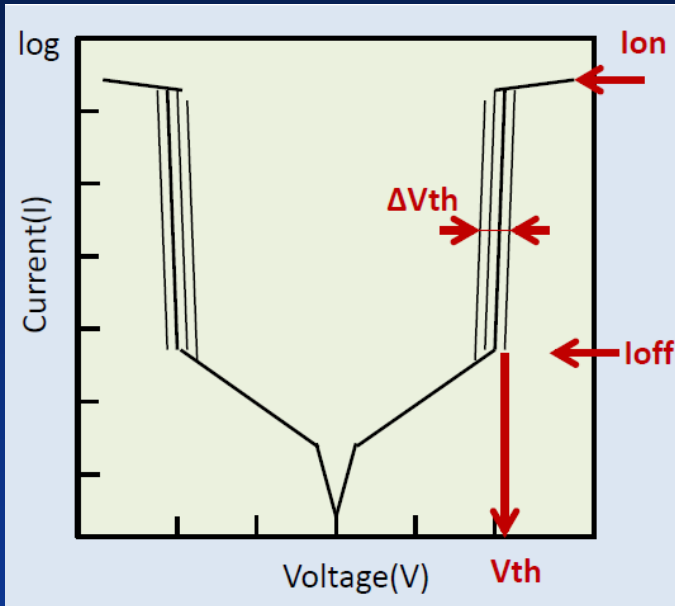


- Big array is used to realize higher capacity
- Half selected cells are over 1k for example
- Need to treat long word line and bit line
- Need scaling to realize higher capacity



High current makes the chip design difficult
(ReRAM: $\sim 50\mu\text{A}$, PCM: $> 100\mu\text{A}$)

Challenges of Selector Technology



Challenge	Issues	
High V_{th}	Retention	△
Small ΔV_{th}	Endurance, Temp, Drift	×
Low I_{off}	Leak, Array Size	△
I_{on} (~50 μ A)	Reliability	○

Most challenge for the product is “Small ΔV_{th} ”



In case of PCM, $I_{on} > 100\mu$ A is more challenge

Summary

- CP is key to realize higher capacity chip
- Advantages of ReRAM over PCM in CP design
- We have still challenges of CP technology