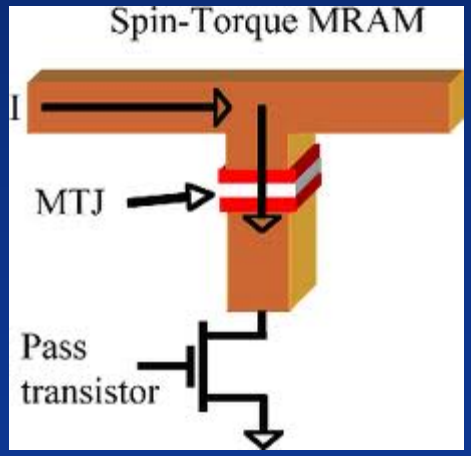

# Focus on strengths and weaknesses of ReRAM

Amigo (Keiichi) Tsutsui

Sony Corporation

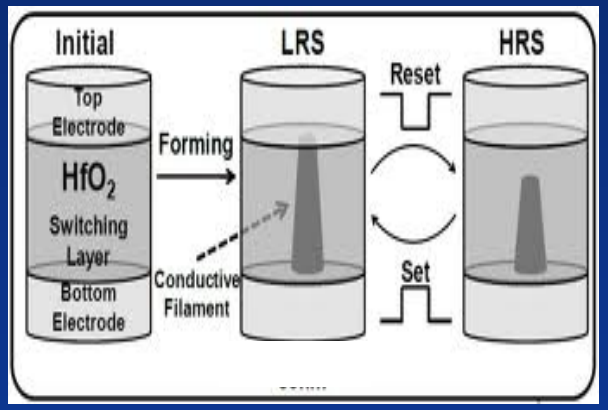
# Emerging Memories

- DRAM and NAND technology have been facing scaling issues
- Emerging memories is trying to offer the potential to be DRAM and NAND drop-in replacement, respectively




**STT MRAM**


**PCM**



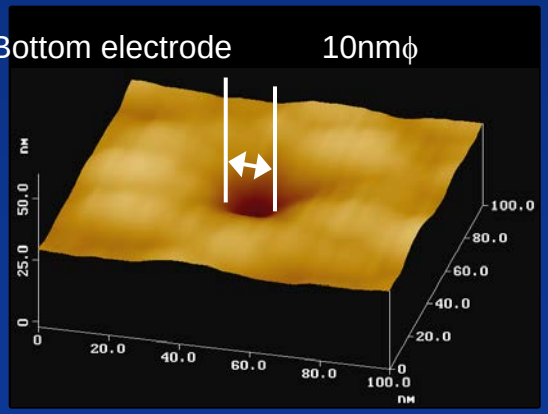

**ReRAM**

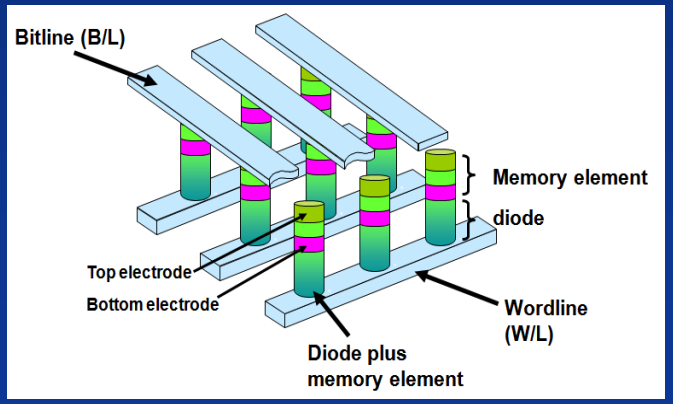
# Increased Attention

- ReRAM technologies attract rising attention
- ReRAMs are expected as high density memories
  - Scaling
  - Cross point type

A total of papers
in IEEE IMW, VLSI Symposium and ISSCC

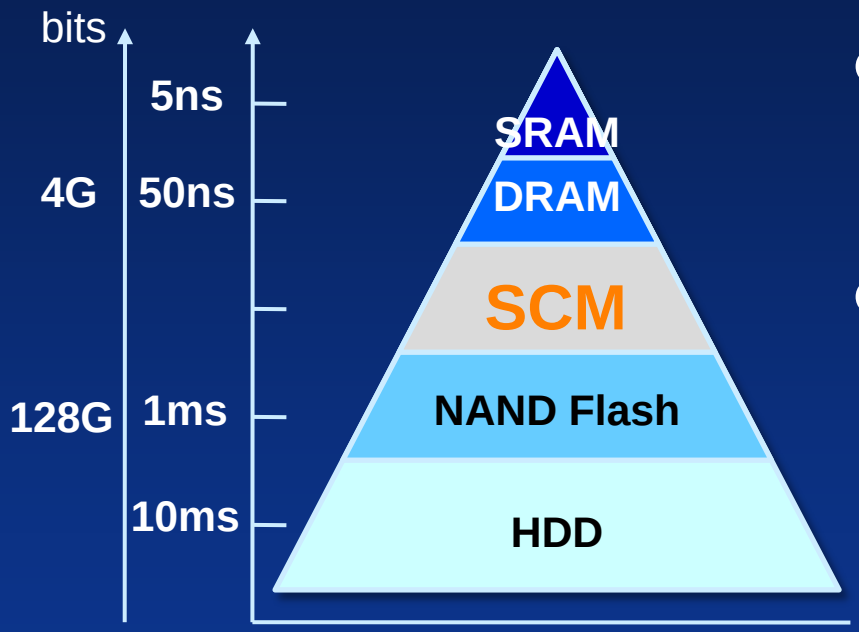
| | 2012 | 2013 |
|---|---|---|
| ReRAM | 26 | 31 |
| PCM | 8 | 5 |
| STT MRAM | 13 | 13 |



# SCM Requirement

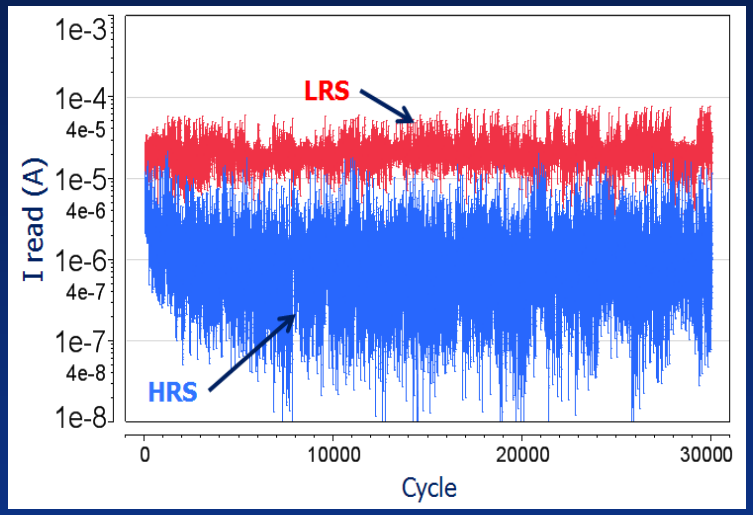
## Expected Future




- SCM is main application for ReRAM technologies
- SCM Requirement
  - Performance
    Between DRAM and NAND
  - Density (bit cost)
    Between DRAM and NAND

In 2015,
Key aspect is to realize at least 16 Gbit as the product

# Need Dedicated Controller




- Noisy Signal
- To realize high density ReRAM, dedicated controller technology will be needed
  - High speed
  - Low redundancy

[1] K.Prall, et al.,
"An Update on Emerging Memory: Progress to 2Xnm",
IMW 2012

In the same manner as of expanding NAND market,
Key aspect is ECC to handle the specific error

# Thank you!

For questions, please contact

Amigo Tsutsui

Keiichi.Tsutsui@jp.sony.com