



# Inflection Points

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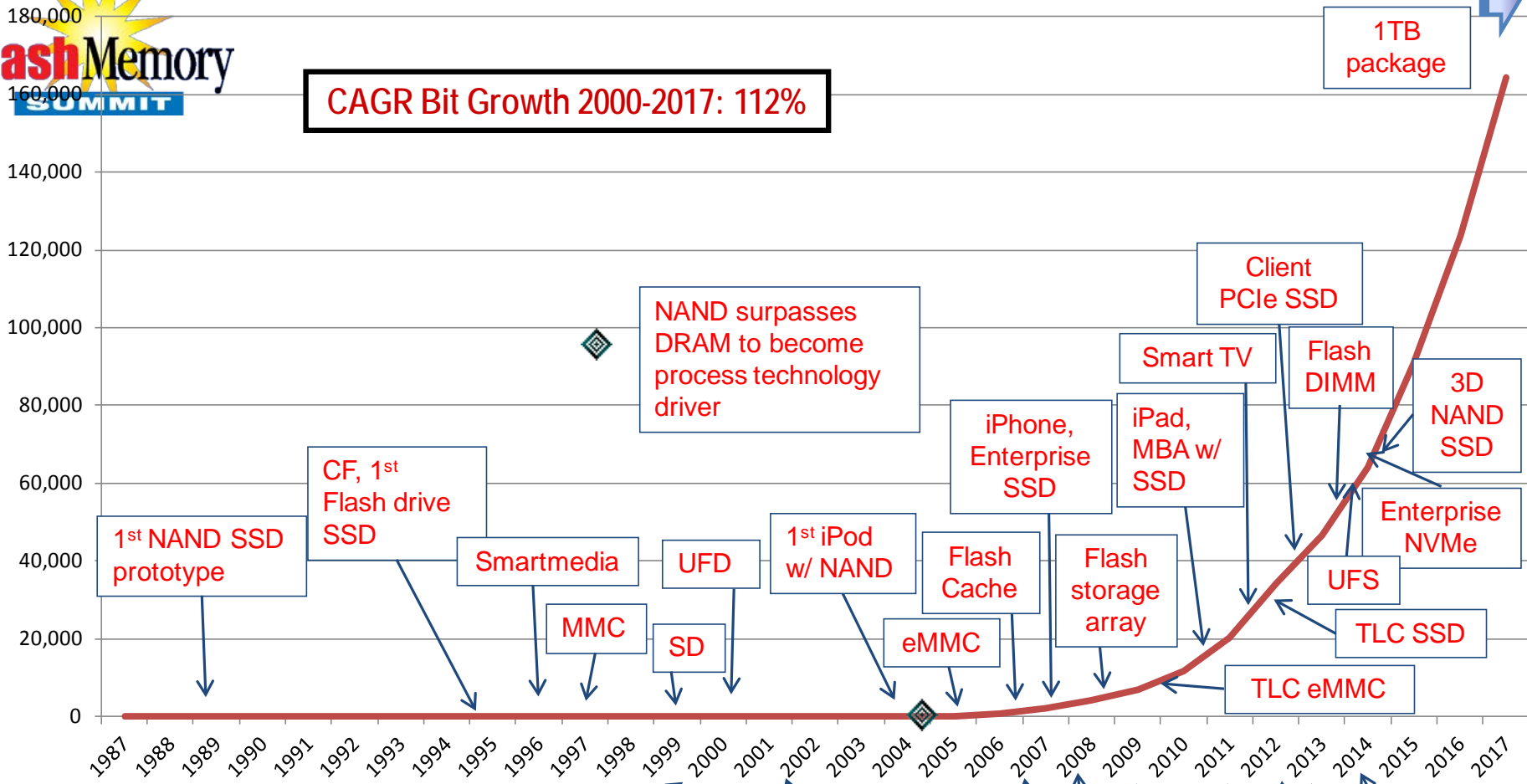
# NAND Flash Memory Inflection Points



CAGR Bit Growth 2000-2017: 112%

Cold Flash? →  
1TB package →

Petabytes Shipped



Toshiba invented NAND flash

0.425µm 32Mb Nand chip

Toshiba licenses NAND to Samsung

Toshiba-SanDisk NAND JV JDP

1st MLC chip

Hynix – ST, Micron enter NAND flash production

Intel JVs w/ Micron

Toshiba BiCS

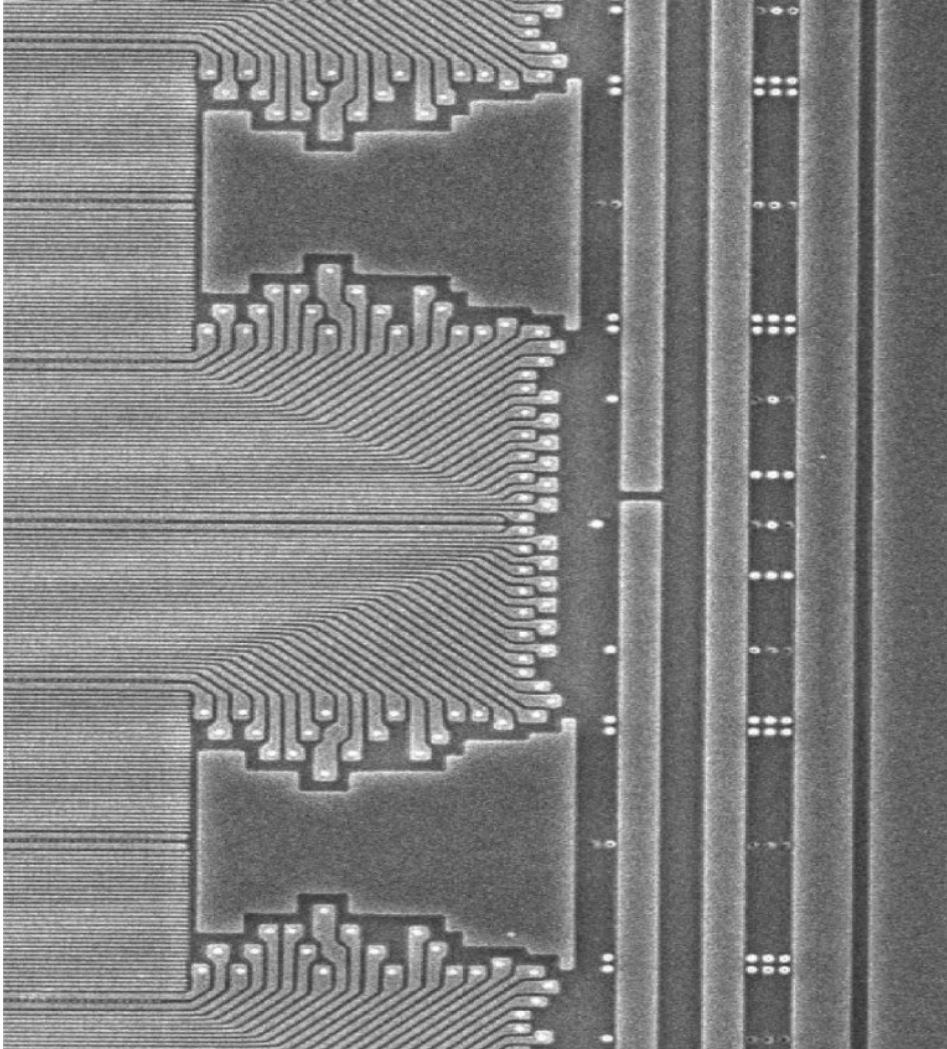
1st TLC chip

HKMG cell

Advanced ECC & DSP  
1st 4bpc chip, 1st ECC NAND chip

1st 3D TLC NAND

3D MLC NAND production



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