

Flash Memory Timeline



1988

Intel introduces NOR flash chips

SunDisk (now SanDisk) founded

150 mm wafers used

Toshiba announces NAND flash

M-Systems founded and introduces the Flash Disk concept (precursor to flash SSDs)

1989

Toshiba ships 1 Mbit NOR chip

1990

First **PCMCIA** flash memory-based memory card introduced

1991

Information Storage Devices introduces flash-based voice recorder chip

1992

AMD's Flash Division (later to be spun-off and merge with **Fujitsu's** Flash Division under the name **Spansion**) NOR product introduced

Fujitsu Flash Division (now merged with **Spansion**) NOR product introduced

M-Systems introduces TrueFFS to be adopted later by the **PCMCIA** committee as FTL—Flash Translation Layer

1993

Datalight introduces "Card Trick" flash management software

SunDisk (now SanDisk) introduces CompactFlash card

Flash (NOR and NAND) revenues exceed \$1 B

0.5 micron process announced

1994

Toshiba introduces SmartMedia Memory Card (originally called Solid State Floppy Disk Card)

Casio introduces the QV-11 digital camera (used flash rather than film or floppy)

Mitsubishi (now merged with **Renesas**) DiNOR introduced

M-Systems introduces flash-based Solid State Drives

M-Systems introduces DiskOnChip (NOR)

SunDisk changes name to SanDisk

1995

Datalight introduces "FlashFX" flash management software supporting NOR and NAND in a single driver

Palm introduces flash-memory based "Palm" PDA

0.35 micron process announced

1996

SaeHan Information Systems introduces flash-based MPMan MP3 player

SanDisk and **Siemens** introduce the MultiMedia Card (MMC and MMCplus)

Sony introduces the Memory Stick

First cell phones ship with flash memory

Intel ships first MLC flash memory product—StrataFlash

M-Systems introduces DiskOnChip (NAND-based)

200 mm wafers begin production

500 million flash chips ship

1997