SanDisk

SanDisk Solid State Drives – A Brief History

Users range from soldiers to road warriors

The Time is Right

When the first generation of SanDisk solid state drive (SSD) was brought to the military and aerospace industries in 1998, it was acquired by a market that was willing to pay dearly for its benefits. With underpinnings in solid state technology that had been popularized in the 1960s, the SanDisk SSD was introduced with the latest technologies to meet grueling mission-critical ruggedness and performance needs. It used flash that cost the end-user a few thousand dollars for 1 megabyte (MB). At the time, the same capacity inside a hard disk drive (HDD) cost tens of dollars. Even at this price, many essential applications chose the SSD for its durability, since they could not afford to take the risk of losing their data due to a hard disk drive crash.

Since then, changes have come fast and furious:

- The price of flash has fallen at an annual rate of 50% and sometimes even more. Today, 1GB of NAND flash costs under $10.
- Etching processes have dropped from 90 nanometers (nm) in 2005 to 50nm in 2007.
- New technologies use less silicon to produce ever higher capacities. Multi-level cell (MLC) NAND, for instance, stores twice as much data in a cell than the standard single-level cell (SLC) NAND, and x4 NAND stores four times more data.
- At SanDisk, the flash controller has undergone many enhancements. It employs more robust algorithms and sophisticated flash management to handle finer processes and much denser technologies.

A Strong History: Four Generations of SanDisk SSDs

SanDisk SSD product lines made major strides with each new generation. They connected to the fastest interfaces available at the time, offering higher capacities and implementing the latest in flash technologies, processes and management.

The first four generations of SanDisk SSDs found their way into a legion of applications, including:

- **Military and Aerospace** – Tactical computers inside mission-critical systems on the battlefield, advanced targeting pods, long-range airborne surveillance systems, rugged data and digital video recorders.
- **Public Safety** – Rugged laptops used by police and firefighters to withstand on-the-job challenges of shock, vibration and temperature extremes, data recorders for surveillance and traffic control systems on buses and trains.
- **Industrial** – Factory automation in the textile industry and rugged laptops for vehicles in construction sites.
- **Telecom** –Blade servers, kiosks, media gateways, transport and optical switching systems, base stations and VPNs.

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A Vibrant Present: SanDisk SSD 5000

The newest, fifth generation SanDisk SSD 5000 draws on the best that its predecessors had to offer. It has been optimized for use inside notebook computers to provide durable, high-performance, power-efficient memory.

The enthusiastic buzz surrounding the recent announcements of SanDisk SSD 5000 UATA 1.8" and SanDisk SSD 5000 SATA 2.5" radiated around the world. In a live vote conducted by MSNBC during the Consumer Electronics Show in January 2007, for instance, SanDisk SSD 1.8" led by an overwhelming 59% in answer to the question: "Which product are you most interested in bringing home?" Second place came in with only 10% of the vote.

A Versatile Future

Next generation SanDisk SSDs for notebook computers, already in process, will build upon the impressive foundation of SanDisk SSD 5000 to continue to ensure the benefits of flash over the HDD, while bringing down cost and increasing capacity.

If current interest in SanDisk SSD 5000 is any indicator, the next generation may just find its way into university labs and even amusement parks, where its durability will help keep rides running more smoothly and safely.

Analysts predict a bright future for SSDs:

> "More than half of the new notebook PCs sold worldwide in the fourth quarter of 2009 will use some form of flash memory for data storage, up from a negligible total now, according to data from iSuppli Corp.'s new Technology Penetration Database."
>
> iSuppli Applied Market Intelligence, May 2, 2007,
> http://www.isuppli.com/news/default.asp?id=7869

> "Dell's support of SSDs is a significant boost for the technology… While many OEMs are considering making SSDs available in their products, Dell's move will likely push the market faster."
>
> "Dell Takes a Solid Stance on Notebook Storage"
> Richard Shim, Jeffrey Janukowicz
> IDC, Event Flash, April 2007