

SanDisk® SSD

SanDisk Solid State Drive

Durable
High Performance
Power Efficient



Our Leading Solid State Drive for Mobile Computing

SanDisk solid state drive (SSD), field-proven for over a decade in the harshest of operating environments, is now reshaping the landscape of mobile computing.

Using the best of flash enhanced by our extensive IP portfolio, the SanDisk SSD family brings durability, performance and power efficiency to a peak. With unbeatable mean time between failure (MTBF) rates as compared with the hard disk drive, SanDisk SSD trims back maintenance costs to cut down the total cost of ownership (TCO) of notebooks – particularly critical in the enterprise space.

SanDisk SSD. It takes flash in mobile computing to new heights.

SanDisk®

SanDisk. Driving the shift to flash.

Every day, flash is gaining wider endorsement from key operating systems, such as Microsoft® Windows Vista™, and from many storage players in the mobile computing market. Interim solutions, such as the hybrid hard drive and the flash-based cache, combine the benefits of flash with the hard disk drive (HDD). But as the price of flash continues to decline, the SSD is now set to take the flash advantage one level higher: it completely eliminates the mechanical failures of the HDD.

SanDisk, the industry leader in flash storage, is uniquely positioned to drive the paradigm shift in mobile computing to SSDs. Inside enterprise computers, such as the thin and light laptop and ultra-mobile PC (UMPC), SanDisk SSD delivers unbeatable durability, system performance and power efficiency as compared with the HDD.



Most Durable and Reliable

SanDisk SSD is ideal for road warriors and other enterprise users who rely heavily on the data they store in their notebooks.

- With no moving parts, SanDisk SSD can withstand extreme temperature ranges, and conditions of vibration and shock in transit, as well as in outdoor environments.
- SanDisk SSD improves MTBF rates up to six times as compared with the rotating HDD.
- SanDisk's defacto industry standard TrueFFS® flash file system guarantees top data reliability and flash endurance.

High Performance

Flash memory delivers performance that keeps pace with "on the go" lifestyles. Compared with the HDD:

- SanDisk SSD, with no random performance limitations, speeds up operating system boot and application launch/runtime by up to 2 times.
- SanDisk SSD has no seek or latency time. It boosts average access time by up to an amazing 158 times!
- SanDisk SSD maintains fixed performance that does not deteriorate over time as the media fills up.

More Power Efficient

Flash memory saves power, keeping notebooks running longer so that users in transit can perform numerous read/write tasks every operating hour. In a typical working scenario based on the MobileMark® benchmark:

- SanDisk SSD consumes up to 50 percent less power than the HDD.
- SanDisk SSD extends the battery life.

More Cost-Effective

Flash prices continue to decline dramatically from year to year while densities double at the same rate.

- High flash reliability cuts tangible costs associated with IT person hours, loss of productivity, data recovery, warranty and service.
- High flash reliability reduces intangible costs associated with inaccessible data from outside the office, loss of business opportunities and reputation.
- SanDisk SSD uses its own patented flash management to take advantage of the most advanced, cost-effective flash technology – while keeping performance high.
- Flash requires no maintenance, further reducing the total cost of ownership (TCO) of SanDisk SSD as compared with the HDD.

Smaller Form Factor

Flash enables sleek and slim notebook designs.

- Flash is available in smaller form factors than the HDD.
- Case-less flash weighs less and occupies less real estate.

Cooler

With no moving parts, flash remains cool in operation.

- Unlike HDDs, SanDisk SSD does not require constant cooling for proper operation.
- SanDisk SSD keeps notebooks cooler by consuming significantly less power than the HDD.

More Secure

SanDisk SSD helps to ensure that confidential files remain confidential.

- SanDisk SSD enables password login.
- SanDisk SSD supports ATA security features.

Environmentally Friendly

Flash components are attuned to cleaner environment standards.

- Flash is noise-free, enhancing the user experience.
- Flash is RoHS compliant.



SSD 1.8" vs. HDD 1.8"

Parameter		SanDisk ¹ SSD 1.8"	HDD 1.8" ²	SSD Benefits vs. HDD
Interface		ATA-7	ATA-6	More advanced
Performance	Burst	100MB/sec	100MB/sec	Same
	Read ³	62MB/sec	12-26MB/sec	~3x faster
	Write ³	36MB/sec	12-26MB/sec	~2x faster
	Average access time ³	0.12msec	19msec	158x faster
	Microsoft® Vista™ OS boot time ⁴	35 sec	55 sec	1.5x faster
	Microsoft® XP OS boot time ⁵	12 sec	31 sec	2.5x faster
	I/O per second (IOPS) for 512B transfer size ⁶	Read: 7000	Read: 51	137x faster
Power	Spin-up	0.0W	1.8W	No spin-up power
	Read/Write	0.4W	1.0W	2.5x less
	Idle	0.2W	0.4W	2x less
Reliability	MTBF ⁷	2.0M hours	300K hours	~6x better
Temperature Conditions	Operating	0°C to 70°C	5°C to 60°C	Wider
	Non-operating	-55°C to 95°C	-25°C to 65°C	Wider
Vibration	Operating	2.17G (7-800 Hz)	2.0G (15-500 Hz)	More durable
Shock	Operating	1,500G/0.5msec	500G/2.0msec	More durable
	Non-operating	1,500G/0.5msec	1,500G/1.0msec	More durable
Acoustic Noise	Active	0dB	22dB	No noise

1 megabyte (MB) = 1 million bytes; 1 gigabyte (GB) = 1 billion bytes

1. SSD UATA 5000 1.8" 32GB ZIF

2. MK6008GAH, 4200RPM, 60GB, ATA ZIF

3. H2BENCH 3.6; average access time =

average seek time + average latency time

4. Stopwatch test performed internally at SanDisk;

Dell Latitude D420 notebook (Intel Core Duo
Processor ULV U2500, 1.20GHz, 533MHz, 1.0GB RAM

DDR2-533 SDRAM); Microsoft Windows Vista

5. Microsoft Bootvis; Dell Latitude D420 notebook

(Intel Core Duo Processor ULV U2500, 1.20GHz,

533MHz, 1.0GB RAM, DDR2-533 SDRAM);

Microsoft Windows XP

6. IOMETER 2003.12.16

7. MTBF is calculated based on the Parts

Stress Method, Telecordia SR-332

SSD 2.5" vs. HDD 2.5" (Preliminary)

Parameter		SanDisk ¹ SSD 2.5"	HDD 2.5" ²	SSD Benefits vs. HDD
Interface		SATA 1.0a	SATA 1.0a	Same
Performance	Burst	150MB/sec	150MB/sec	Same
	Read ³	67MB/sec	18-35MB/sec	~2x faster
	Write ³	45MB/sec	18-35MB/sec	1.4x faster
	Average access time ³	0.11ms	17ms	154x faster
	Microsoft® Vista™ OS boot time ⁴	30 sec	48 sec	1.5x faster
	Microsoft® XP OS boot time ⁵	12 sec	22 sec	1.7x faster
	I/O per second (IOPS) for 512B transfer size ⁶	Read: 7000	Read: 56	125x faster
Power	Spin-up	0.0W	5.0W	No spin-up power
	Read/Write	0.9W	1.9W	~2x less
	Idle	0.4W	0.6W	~2x less
Reliability	MTBF ⁷	2.0M hours	300K hours	~6x better
Temperature Conditions	Operating	0°C to 70°C	5°C to 55°C	Wider
	Non-operating	-55°C to 95°C	-40°C to 65°C	Wider
Vibration	Operating	2.17G (7-800 Hz)	1.0G (5-500 Hz)	More durable
Shock	Operating	1,500G/0.5msec	300G/2.0msec	More durable
	Non-operating	1,500G/0.5msec	900G/1.0msec	More durable
Acoustic Noise	Active	0dB	26dB	No noise

1 megabyte (MB) = 1 million bytes; 1 gigabyte (GB) = 1 billion bytes

1. SSD SATA 5000 2.5" 32GB

2. MHV2080BH, 5400RPM, 80GB, SATA

3. H2BENCH 3.6; average access time =

average seek time + average latency time

4. Stopwatch test performed internally at SanDisk;

Dell Latitude D620 notebook (Intel Core Duo

Processor T7200, 2.0GHz, 1GB RAM); Microsoft

Windows Vista

5. Microsoft Bootvis; Dell Latitude D620 notebook

(Intel Core Duo Processor T7200, 2.0GHz,

1GB RAM); Microsoft Windows XP

6. IOMETER 2003.12.16"

7. MTBF is calculated based on the Parts

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