

Are Hard Disk Drive's Days Numbered?

Inside this issue:

Solid State Flash Memory 1

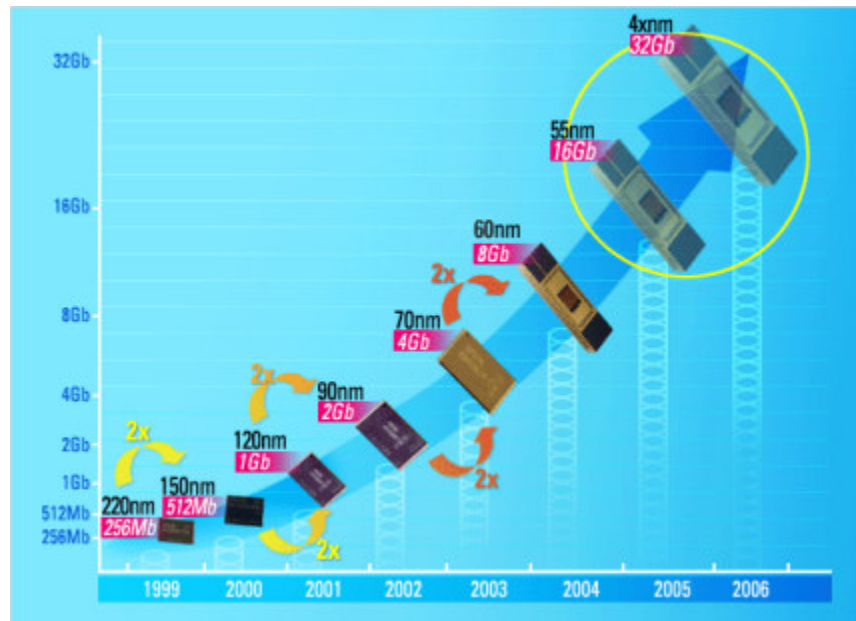
Flash on the March 2

About Flash Memory 2

USB Thumb Drives 3

Are Hard Disk Drives' Days Numbered? 3

Flash Memory Data Recovery 3



(Courtesy of Samsung)

Solid State Flash Memory

1000 Miles Network (AP) Pte Ltd has built the capability to provide Data Recovery Services for both Flash Memory on various storage media as well as Micro Hard Disks.

We believe Flash Memory is the future.

Samsung has recently announced that the high capacity 40-nanometer (nm) 32GB Flash Memory (NAND) chip is next in the pipeline following the successful launch of the 16GB chip during Christmas last year. The densities of top-in-the-line Flash Memory chip has been doubling each year, 64-128GB is expected to be in the market by end of this year.

The insatiable demand for storage in digital consumer devices has continued to be the main driver in the development and demand of Flash Memory — small, compact in physical size, yet utilizing the least amount of battery power.

Will the Flash Memory find its way to notebooks and PDAs?

Not only will it shave off extra weight from our shoulders, it will save on battery life since it consumes much less power and likely faster boot up times as well.

Will the Flash Memory finally replace the traditional hard disk drives?

The day will come before the end of the decade, as some has prophesized. Flash Memory has made obsolete the 3.25" floppy disk drives and began to pose direct challenge to high-density DVD technology.

In this edition of newsletter, **1000 Miles Network** finds out.

Flash on the March

A new wave of portable devices powered by 40-nanometer 32GB NAND Flash Memory chips look set to hit the market this year. Typically, the 32Gb NAND flash memory can be used in memory cards with densities of up to 64-Gigabytes (GBs). One 64GB card will be capable of storing over 64 hours of DVD resolution movies (40 movies) or 16,000 MP3 music titles (1,340 hours).

With 40-nanometer technology, it meant that the electronic circuits are being etched on a surface whose size is so small that it equates roughly one-3000th the thickness of a human hair.

1000 Miles Network, whose business relates to data recovery and embedded systems design, we felt challenged yet at the same time encouraged by recent technology developments. Challenged, because we need to keep abreast of new technology, constantly working to recover data from newer storage media formats. Encouraged, because we always seek to keep our embedded products small in size and energy efficient, without compromising on reliability and performance.

About Flash Memory

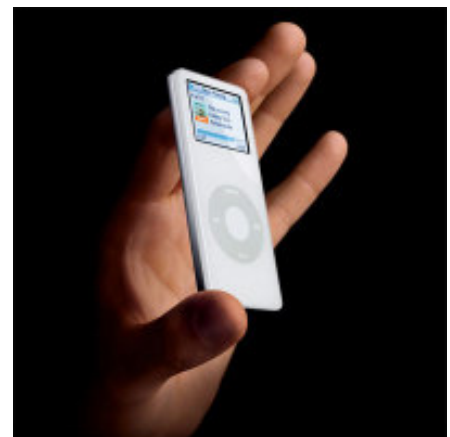
Flash memory was invented by Dr. Fujio Masuoka from Toshiba in 1984. It is a form of non-volatile memory that can be electrically erased and rewrite, and retains its memory after power has been turned off.

Currently, there are two types of Flash Memory, namely NOR and NAND. NOR chips are suitable for running software directly, but are slower and more expensive to manufacture. NAND chips, on the other hand, have faster read-access times and are available in larger capacities. With higher density and lower cost per bit, the latter is fast becoming the mainstream data storage device in Digital Cameras, MP3 Player and Smart Phones.

With densities soon to exceed 32GB this year, Flash Memory drives may finally matured into a large capacity product that takes up little space and has much lower power requirements than a traditional hard disk drive (using 30 times less power). Besides its size and lightweight, it is also considerably more reliable and durable, due to its lack of mechanical parts.



NAND Flash Memory
(Courtesy of Samsung)



Apple iPod Nano uses Samsung NAND Flash Memory

Item	Flash SSD		HDD	
	1.8" (2.5")	2.5"	1.8"	1.0"
Weight (g)	30g (50 g)	100 g	62 g	16 g
Sustained R/W (MB)	58 / 32*	25/25*	20/20*	4.3~7.2*
Voltage	3.3V(5V)	5V	3.3V	5V/3.3V
Interface	ATA-5	ATA-6	ATA-5	ATA-3
Acoustics (Active/Idle)	0 dB	2.9/2.4 dB	2.9/2.4 dB	2.1/1.8 dB
Density	~32 GB	80 GB	60 GB	4 GB
Active	0.5 W	2.1 W	1.4 W	1 W
Idle	0.1 W	1.5 W	0.33 W	0.6 W
Standby	0.06 W	0.2 W	0.1 W	0.05 W

Flash Memory is also commonly used in removable memory cards, found in digital devices such as MP3 players, cameras, smart phones and PDAs. These cards come in a board range of media formats - CompactFlash (CF), Secure Digital (SD), Extreme_Digital (XD), Multi-Media Card (MMC) , Memory Sticks etc.

In fact, Apple iPod Mini, one of the world's most popular MP3 player, runs on the 1" micro hard drive. Only to be ruled out of favor by iPod Nano last Christmas, the Flash-based version launched with a 4GB Flash Memory chip.

It boasts a longer battery life, weigh less and output less heat, enclosed in a gadget the size of a credit-card.

USB Thumb Drives

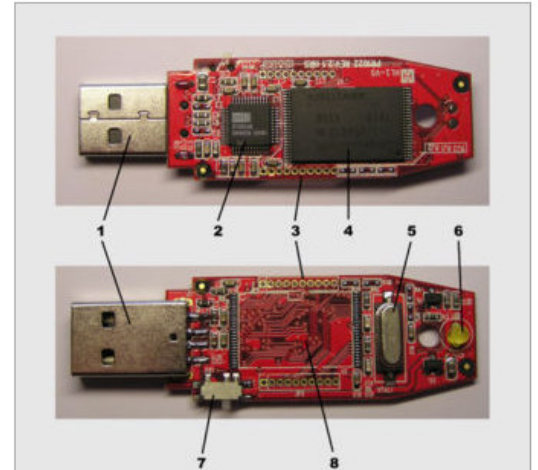
Flash Memory can also come packaged as portable, thumb-sized USB memory drives.

With USB ports are now universal and drivers built-in most modern operating systems, these devices are handy for carry data and can be made to run programs directly off storage. Such as taking your emails and security settings with you to use on any Windows PCs, wiping any trace of use on that PC once unplug the unit.

Or the ability to run a growing numbers of popular software programs from the USB drive, without needing to install or uninstall anything on the host PCs, such as your favorite instant messaging software or Skype for VoIP phone calls. Even the ability to directly boot up with newer motherboards.

Basically, the USB thumb drive is made up of two main components: a small printed circuit board which contains the Flash Memory chip, and the USB connector itself. The circuit board is encased in a plastic surround, while the exposed USB connector is protected by a removable cap.

Because there is no moving mechanical parts, it is much hardier than floppy drives and more durable than hard disk drives, thumb drives are not infallible. Flash Memory can only sustain a finite number of write/erase cycles before failure - typically several millions, and with age, its performance will decrease.



The internal components of a typical flash drive

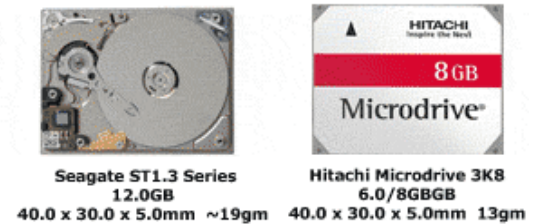
- 1 USB connector
- 2 USB mass storage controller device
- 3 Test points
- 4 Flash memory chip
- 5 Crystal oscillator
- 6 LED
- 7 Write-protect switch
- 8 Unpopulated space for second flash memory chip

Are Hard Disk Drives' Days Numbered?

Do not discount the humble hard disk drive yet. Manufacturers are improving on the 1" micro-hard drives, rivaling the pace of Flash Memory. In terms of cost per byte, Flash drives remain relatively a lot more expensive than hard disk drives.

From perceptive of cost and affordability, it look unlikely that Flash will replace traditional hard disk drives in laptop and desktop PCs any time soon before the end of the decade, especially with appetite for capacity ever increasing, growing from gigabytes into terabytes.

Flash being more robust, smaller and uses less power, will however, see increasing more usage in portable digital devices and embedded applications. In fact, we have began researching on combining the latest Flash technology for our storage solutions in our embedded system design.



Micro Hard Disks Still in Demand



Flash Memory Data Recovery

Flash Memory cards and thumb drives share the same features of an easily rewritable memory, that in the event of system failure, power surges, accidental erasure, re-format, improper USB port termination etc, may cause data corruptions. Data can be lost or damaged due to hardware breakdown and/or software malfunctions.

1000 Miles Network has the technology for Flash Memory Data Recovery, a process of restoring data from the storage media when it cannot be accessed normally. In most instances, we are able to repair corrupted file systems and restore accidentally deleted files due to both physical or logical damage to the storage media.

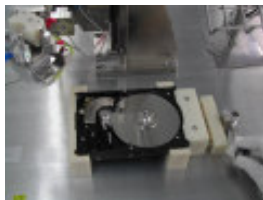
Our Portfolio

We offer affordable, 24 x 7 round-the-clock professional data recovery services, with our customer hotline telephone number for all data storage media issues, whether disk crash due to mechanical failure, accidental data erase due to human error, disk failed to boot due to virus attack, even fire or water damage.

Our engineers have a combined over 20 years of related working experience and technical knowledge – working with education institutions, major hard disk and storage manufacturers, and business partners in a niche, tightly integrated market, allowing us readily access to the resources necessary for faster turnaround and more cost efficient solutions than our competitors.

All Types of Media	Various form factors: 1", 1.8", 2.5", 3.5", 5.25", 8" and any USB HDD, SCSI , IDE/ATA and SATA disk media. Any brands. Flash Disks, Memory Sticks and Memory Cards (CF, SD, CD etc.)
Most Known Operating Systems	Various OS platforms: MS Windows, Mac OS, Sun Solaris, IBM AIX, HP UX and Linux variants
Our Data Recovery Services	Recovery of lost files, directories and partitions from damaged storage media. The costs and estimated turnaround time for Data Recovery will depends on factors: <ul style="list-style-type: none"> • Type of Service Plans • Type of Failures: Logical or Physical • Media Types and Capacity Size • Level of Difficulty in Recovery of Data • Availability and Delivery of Replacement Parts
Our Data Special Handling Services	Safe and secured disposal of data and media <ul style="list-style-type: none"> • Disk Erasure • Drive Degaussing • Disk Destruction (Physically)
Our Prices	Logical Recovery from \$\$100 + Physical Recovery from \$\$300 +

+ subjected to the extent of damage



Disk Disassembly



Specialized Work-bench



Certified Class 100 Clean Room



Disk Diagnostics

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1000 Miles Network is a turnkey integrated engineering and information technology solution provider since 1999, that offers value-added consultancy services for :

Industrial Automation

Embedded Systems Design, Turnkey Automation and Control solutions for building and facilities, Integrated Process Control and Instrumentation, Data Acquisition and Logging, Monitoring and Alerts, Sensor Calibration and Testing, Network Connectivity

Storage Solutions

Certified Class 100 Clean Room, Professional Data Recovery Services for all hard disks and removable storage, Safe and Secured Disposal of Data and Media - Disk Erasure and Degaussing, Portable Hard Disk Storage



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