

## **Toshiba Leads Industry in Bringing Perpendicular Data Recording to HDD--Sets New Record for Storage Capacity With Two New HDDs**

14 December, 2004

### **Perpendicular Recording Technology Achieves 1.8-inch Drive That Holds the Industry Largest 80-gigabytes Of Information**



TOKYO -- Toshiba Corporation today announced the world's first<sup>\*1</sup> hard disk drives (HDD) based on perpendicular recording, a breakthrough technology that sets new benchmarks for data density, boosting the capacity of a single 1.8-inch hard-disk platter to 40 gigabytes. Toshiba has brought the new technology to two high capacity drives: the MK4007GAL HDD packs 40GB into a drive only five millimeters thick, while the MK8007GAH achieves a capacity of 80GB--the largest capacity<sup>\*1</sup> yet achieved in the 1.8-inch form factor. Toshiba plans to start mass production of the 40GB and 80GB<sup>\*2</sup> drives in the first and second quarters, respectively, of the fiscal year starting April 1, 2005.

Toshiba is the first company<sup>\*1</sup> in the storage device industry to commercialize perpendicular magnetic recording, and the company has applied the technology to HDD that achieve unsurpassed recording density and high operating reliability. This success rests on development of a new magnetic disk structured to support perpendicular recording, a new high performance perpendicular magnetic head, and disk and head integration technology that maximizes their combined performance.

"It is my great pleasure to announce our achievement of introducing the new HDDs made possible by our breakthrough in perpendicular recording technology," said Kazuyoshi Yamamori, Vice President of Storage Device Division at Toshiba Corporation's Digital Media Network Company, "Our research confirmed the superior potential of perpendicular recording technology, and we have now achieved the core head and disk technologies required for reliable, high-density recording. The performance of our new HDDs, and our success in bringing this important technology to market ahead of the industry, allows Toshiba to promote continued product differentiation and to further expand our business in small form factor HDDs."

Conventional longitudinal recording stores data on a magnetic disk as microscopic magnet bits aligned in plane. Although advances in magnetic coatings continue to improve data recording densities on HDD, the magnetic bits repulse each other due to in-plane alignment. Squeezing more bits on to a disk will eventually reach a point where crowding degrades recorded bit quality. This places fast-approaching limits on storage capacities. By standing the magnetic bits on end, perpendicular recording reinforces magnetic coupling between neighboring bits, achieving stable higher recording densities and improved storage capacity.

Toshiba's new HDDs achieve the highest areal density yet reported, 206 megabits per square millimeter<sup>\*3</sup> (133 gigabits per square inch). The 40GB platter capacity is 33%<sup>\*4</sup> more than that of Toshiba's conventional HDD.

Toshiba will also apply the new technology to the 0.85-inch HDD that it announced in January this year, a move that will push capacity to 6 to 8GB per platter and support Toshiba in pioneering the market for ultra-small form factor drives.

## Main Specifications

Model name	MK8007GAH	MK4007GAL
Formatted capacity <sup>*2</sup>	80GB	40GB
Number of platters	2	1
Number of heads	4	2
Average seek time	15msec	
Data transfer rate	Ultra DMA/100	
Rotational speed	4,200rpm	
Interface	ATA-6	
External dimensions	54 x 78.5 x 8 (mm)	54 x 78.5 x 5 (mm)
Weight	62g	51g
Shock resistance	Operating: 4,900m/s <sup>2</sup> (500G: 2msec) Non-operating: 14,700m/s <sup>2</sup> (1,500G: 1msec)	

(\*1) as of December 14, 2004

(\*2) Capacity of HDD is calculated with a basis of 1-giga byte (GB) = 1-billion bytes.

(\*3) the industry highest recording density in commercially available as of December 14, 2004.

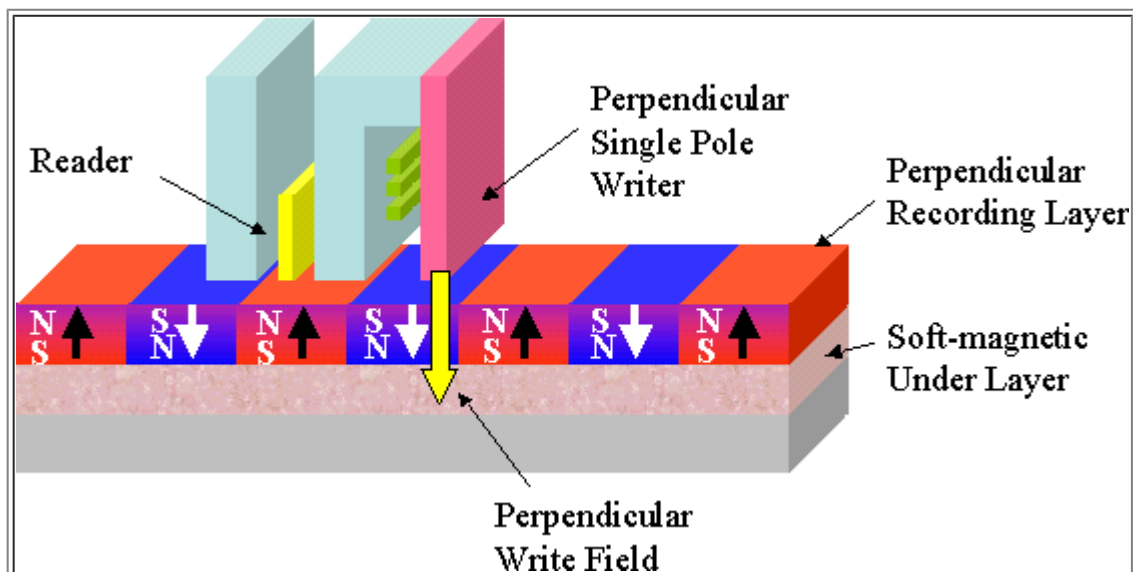
(\*4) Comparison based on Toshiba's current 1.8-inch 30GB HDD, MK3006GAL

## <Attachment>

### Comparison of Recording Systems in HDD

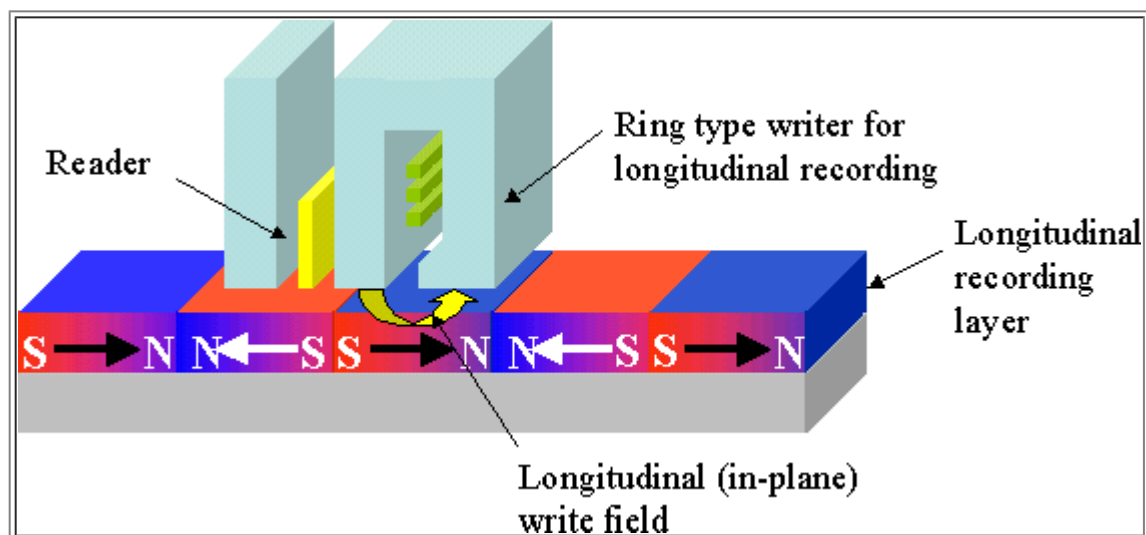
#### 1. Perpendicular Recording System

The perpendicular recording system is suitable for high density recording because of the strong magnetic coupling between neighboring magnetic bits.



#### 2. Longitudinal Recording System (Conventional)

Recorded magnets repulse and weaken each other in longitudinal recording.



Information in the press releases, including product prices and specifications, content of services and contact information, is current on the date of the press announcement, but is subject to change without prior notice.