8-Gigabit NAND Flash Memory Chip With 70 nm Process Technology

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Toshiba Corporation and SanDisk® Corporation (NASDAQ:SNDK) today announced an 8-gigabit (Gb) NAND flash memory chip fabricated with 70-nanometer (nm) process technology that ushers in the new era of gigabyte chips: 1-gigabyte data storage capacity on a single chip. The new chip was today reported at the International Solid-State Circuits Conference (ISSCC) 2005 in San Francisco.

The new NAND flash memory utilizes multi-level cell (MLC) technology that allows two bits of data to be stored in one memory cell, doubling memory capacity. Innovative circuit design techniques were utilized to improve chip area efficiency resulting in an 8Gb chip size that is less than 5 percent larger than the previous generation 4Gb chip on 90 nanometer. At 146 millimeter square, the 8Gb chip has an areal density of 6 billion bits or 3 billion transistors per square centimeter (20 billion transistors per square inch of silicon).

Performance is maximized by adoption of fast writing circuit techniques, which reduce data write times and support a fast write speed of 6-megabytes per second. Read speed of 60MB/sec., which is 40% faster than previous generation, has been achieved by a combination of burst mode and high read bandwidth.

Toshiba and SanDisk plan to start production of flash memory products based on the new 8 Gb NAND flash memory technology this summer. In CY 2006 this 8Gb chip will become the production workhorse for the joint venture between Toshiba and SanDisk, bringing significant cost

reductions to the flash storage products of the two companies. The companies also plan to commercialize a 16Gb NAND flash memory IC that stacks two of the 8Gb NAND flash memories in a single package.

Toshiba and SanDisk are technology innovators and market leaders in NAND flash memories—the highly versatile, non-volatile memory integrated into digital consumer and other products. Toshiba has consistently led the way in promoting advances in NAND flash chip capacity and performance, while SanDisk is a leader in flash data storage card products and a pioneer in high density MLC flash memory chip technology.