

Toshiba manufactures 19nm generation NAND Flash Memory with world's largest density, smallest die size

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Toshiba Corporation today announced breakthroughs in NAND flash that secure major advances in chip density and performance. In the 19 nanometer generation, Toshiba has developed a 3-bit-per-cell 128 gigabit (Gb) chip with the world's smallest die size -- 170mm² -- and fastest write speed -- 18MB/s of any 3-bit-per-cell device.

The chip entered mass production earlier this month and Toshiba and its technology partner, SanDisk, unveiled its key technology advances at the <u>International Solid State Circuits Conference</u> (ISSCC) in San Francisco, California on Feb 22.

Manufacturers of NAND flash memories must respond to demand for higher densities at competitive costs for such applications as USB memories and <u>memory cards</u>. Toshiba has achieved both through the application of its innovative technologies.

The new 3-bit-per-cell 19nm generation device uses the three-step programming algorithm and air-gap technology for transistors, effectively reducing coupling between <u>memory cells</u> down to 5%, achieving a write speed performance of 18MB/s. In three-step writing technology, it writes through rough distribution in the second step, and tightens as well-defined distribution at the third.

Toshiba has also optimized the peripheral circuit structure of the chip,



securing a 20% reduction in area from current chips, an achievement that significantly contributed to the 170mm² die size, the smallest yet achieved at this density.

Source: Toshiba Corporation

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