

# Toshiba's Multi-Level Cell NAND Flash Is Now Supported By SigmaTel D-Major Audio Decoders For MP3 Players

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[Toshiba America Electronic Components, Inc.](#) (TAEC), announced today that the company's multi-level cell (MLC) [NAND](#) flash, developed by Toshiba Corp. (Toshiba), is now supported by SigmaTel's popular D-Major series of audio decoders for MP3 players. Separately, SigmaTel today released a software development kit for their D-Major [MP3](#) audio decoders that enable designers of MP3 players to utilize MLC NAND Flash memory. **D-Major Audio Decoder and Accompanying Software Development Kit from SigmaTel are Industry's First to Enable MP3 Players to Utilize Cost-effective and High-Density MLC NAND.** MLC NAND Flash stores two bits of information in each memory cell, compared to one bit-per-cell for Single Level Cell (SLC) NAND Flash, and provides excellent reliability and cost/performance value well-suited for use with a wide range of low to high-end consumer products including MP3 players.

"MLC NAND Flash is becoming a popular solution to maximize solid-state data storage capacity in consumer devices," said Brian Kumagai, business development manager, NAND Flash, for TAEC. "Support for MLC NAND in SigmaTel's D-Major audio decoders, which have been widely adopted by leading MP3 player manufacturers, will help make this cost-effective storage option more widely available in next-generation MP3 players."

"Our latest development kit enables our customers to easily integrate

MLC NAND Flash into their players," says Danny Mulligan, vice president and general manager of the portable audio SoC group at SigmaTel. "We pride ourselves on offering the best development and features support, offering MLC NAND Flash as an option to the designer opens up yet another Flash memory source which can enable shorter design cycles and lower system costs."

The STMP35xx software development kit, version 2.520 enables Toshiba's 130 nanometer MLC NAND Flash, available in densities up to 4Gb1, to be used with Sigmatel D-Major audio decoders. Memory controllers used with NAND Flash map around bad memory cells and use error correction code (ECC) to correct bit errors, similar to the way a hard disk drive maps around bad sectors. To optimize performance with MLC NAND, the D-Major audio decoder includes an ECC hardware accelerator to minimize software overhead and optimize performance.

### **NAND Flash Background**

As a recognized pioneer in flash technology, Toshiba invented NOR-type flash technology in 1984 and NAND-type flash technology in 1987. Toshiba maintains leadership in flash technology today, with the industry's broadest selection of 1Gb NAND flash memory and a complete line of NAND memory in densities from 64Mb2 to 8Gb to meet various application requirements. NAND flash has become one of the leading technologies for solid state storage applications because of its high-speed programming capability, high-speed erasing, and low cost. The sequential nature (serial access) of NAND-based Flash memory provides notable advantages for these block-oriented data storage applications. Toshiba's NAND Flash memory products are optimized for general solid state storage, image file storage and audio for applications such as solid state disk drives, digital cameras, audio appliances, set-top boxes and industrial storage.

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