The Tinker's Toolbox - Brian Kumagai of Toshiba on Embedded Memory

Hosted by Alix Paultre, the Tinker's Toolbox is the Advantage Design Group's web-based interview show where we talk about the latest technology, components, and design issues for the electronic design engineering community.

In this podcast we talk to Brian Kumagai of Toshiba about embedded memory. Toshiba recently announced its SmartNAND series which integrates 24nm process NAND flash technology with a control chip that supports error correction code (ECC) and is available in densities ranging from 4 to 64 gigabyte. With SmartNAND, system designers have the ability to directly manage the NAND using a custom or host NAND controller leaving the function of error correction within the NAND package.

Right-click to download the podcast [1]

Here is a link to the podcast in case the playback button is inoperative: Brian Kumagai Interview [1]

Here's the original press release on the technology:

Toshiba America [2] announced that it has enhanced its NAND flash portfolio with the introduction of SmartNAND, its next-generation 24-nanometer (nm) NAND flash product family. The SmartNAND series integrates leading-edge 24nm process NAND flash technology with a control chip that supports error correction code (ECC) and is available in densities ranging from 4 to 64 gigabyte (GB).

The new series is expressly designed to remove the burden of ECC from the host processor, while minimizing protocol changes. SmartNAND simplifies the host-side design and application of advanced NAND technology in a range of applications including portable media players, tablet PCs, digital TVs, set-top-boxes, and other devices that require high-density, non-volatile memory.

Market demand continues to grow for high density chips that support high resolution video and enhanced storage, and Toshiba is an established innovator in this key area. The introduction of SmartNAND reinforces its leadership position.

“Toshiba’s new SmartNAND will provide our customers a smoother design experience into 24nm generation and beyond,” noted Scott Nelson, vice president, Memory Business Unit, Toshiba America Electronic Components, Inc. “By enabling the system designer to directly manage the NAND using a standard or custom host NAND controller, while leaving the function of error correction within the NAND package, SmartNAND results in faster time to market, access to leading geometries and potentially lowers design costs when compared to conventional NAND flash implementations with external ECC.”

The new SmartNAND 24nm product lineup is a replacement for current 32nm generation devices. Its advanced process combined with a faster controller and internal interface achieves faster read and write speeds and enhances overall performance. Optimized to suit design objectives, SmartNAND supports a range of read and write speeds including four read modes and two write modes.

Utilizing the long established raw NAND interface, the SmartNAND family includes new features that are optimized for high-capacity and high-performance applications. Managing bit errors is essential so that digital products can maintain acceptable levels of performance and reliability. The integration of error management with the NAND device, in a single package, allows Toshiba’s customers to take advantage of high capacity, advanced flash memory solutions that offer excellent error management.

Samples of the new SmartNAND family are available in mid-April and mass production will begin in the second quarter of CY2011 (April to June).

Product Number	Capacity	Package	Start of samples	Start of mass production
THGVR1G5D1HTA00	4GB	48 pin TSOP	May, 2011	2Q, 2011
THGVR1G5D1HLA09		52 land LGA	August, 2011	3Q, 2011
THGVR1G6D1GTA00	8GB	48 pin TSOP	April, 2011	2Q, 2011
THGVR1G6D1GLA09		52 land LGA	July, 2011	3Q, 2011
THGVR1G7D2GTA00	16GB	48 pin TSOP	September, 2011	4Q, 2011

THGVR1G7D2GLA09		52 land LGA	May, 2011	2Q, 2011
THGVR1G8D4GLA09	32GB	52 land LGA	June, 2011	3Q, 2011
THGVR1G9D8GLA09	64GB	52 land LGA	August, 2011	3Q, 2011

Key Features

1. The integrated error correction (ECC) and leading edge 24nm process generation allows for enhanced speed performance of 1.9 times faster read speed and 1.5 times faster write speed than the current lineup.

2. Toshiba’s SmartNAND offers a range of read and write speeds to vary optimized speed performance; the read speed will be available in four options, and the write speed in two. Power save mode is also available for lower power requests.

3. Toshiba’s SmartNAND utilizes a standard raw NAND interface, allowing easy replacement of standard NAND. SmartNAND can be applied to existing host controllers with driver software support, if necessary. This simplifies system development, allowing manufacturers to minimize development costs and to improve time to market for new and upgraded products.

Product Specifications

Interface	Standard NAND flash memory interface
Page Size	8K Byte
Voltage	Vcc=.2.7?3.6V
Read & Write Mode	?4 Type Read Mode, 2 Type Write Mode ?Power Save Mode is applicable to all functions
Normal Mode & Reliable Mode	?Normal Mode; MLC?2bit/Cell? ?In reliable mode, it operates as pseudo SLC, and the host side can area in block or chip basis for normal mode or reliable mode.
Package	?48 pin TSOP?12mm x 20mm x 1.2mm? ?52 land LGA (14mm x 18mm x 1.0mm)

For additional company information, please visit www.toshiba.com/taec [2]. For more information on Toshiba memory products, please visit

www.memory.toshiba.com [3].

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