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Toshiba Announces High-Performance, Power-Efficient Solid State Drives Targeted at Broad Range of Notebook, Desktop, Embedded and Commercial Markets

Industry's first SSDs with 19 nanometer NAND flash technology for high performance, leveraging Toshiba's 25 years of NAND flash leadership

IRVINE, Calif., June 4, 2012 — Toshiba Storage Products, Business Unit of Toshiba America Electronic Components, Inc., a committed technology leader, today announced a new lineup of solid state drives (SSDs) that provides both high performance and energy efficiency for the most data-intensive and energy-sensitive applications. The THNSNF drives are the world's first to take advantage of 19nm process NAND flash memory, which delivers major advances in power consumption and performance. Continuing Toshiba's long history of innovation in NAND flash memory — 2012 marks the 25th anniversary of Toshiba's invention of NAND flash — the THNSNF series provides an ideal storage solution for high-end and thin and light notebooks, all-in-one desktop computers, embedded systems and external storage devices for consumer and industrial PCs.

The THNSNF series employs Toggle MLC (multi-level cell) NAND flash, which delivers significantly faster performance than competing SSDs using synchronous or asynchronous NAND flash. Clocking in at around twice the speed of Toshiba's HG3 series SSDs, the THNSNF series will be available in four capacities (64, 128, 256, and 512 GB) and in three form factors:

- THNSNFxxxGBSS - 9.5 mm height, SATA 6Gb/s
- THNSNFxxxGCSS -7.0 mm height, SATA 6Gb/s
- THNSNFxxxGMCS - mSATA™, SATA 6Gb/s

Toshiba's unique integrated SSD design and manufacturing capability ensures that key components of the SSD, from firmware to controllers, as well as NAND flash, are designed by Toshiba, further underscoring Toshiba's vertical integration and leadership strengths in the growing SSD market. Toshiba's innovation with the THNSNF series includes data protection through use of Quadruple Swing-By Code (QSBC™), Toshiba's robust and highly efficient error correction code technology.

The THNSNF series delivers efficient power utilization of less than 0. 1 W, exceeding the Business Applications Performance Corporation MobileMark® 2007 benchmark for battery life, a critical standard for next-generation ultrathin notebook PCs as well as current notebook PCs. The THNSNF series employs Advanced Power Management (APM) technology to control power consumption, and offers optional Automatic Thermal Control to reduce power consumption in response to drive temperatures.

"Our customers are increasingly looking to SSDs as a storage solution across multiple products and markets because of the performance and reliability they deliver," said Joel Hagberg, vice president of marketing at Toshiba's Storage Products Business Unit. "The THNSNF series provides not only great performance, but also extremely low power consumption across a broad range of form factors and capacities. These are critical features for our customers as they design the next generation of PCs and embedded systems."

Mass production for the THNSNF series will begin in August 2012.

For more information on Toshiba's line of industry-leading SSDs and hard disk drives (HDD), visit www.toshibastorage.com.

Product Specifications

Model Number	**THNSNFxxxGBSS**	**THNSNFxxxGCSS**	**THNSNFxxxGMCS**
NAND Technology	19nm MLC NAND		
Form Factor	2.5-inch Case		mSATA
Maximum Capacity [1]	64GB, 128GB, 256GB, 512GB		64GB, 128GB, 256GB
Data Transfer Rate			
Max. Sequential Read	524 MB/s{500 MiB/s} (128GB, 256GB, 512GB)	524 MB/s{500 MiB/s} (128GB, 256GB, 512GB)	524 MB/s{500 MiB/s} (128GB, 256GB)
Max. Sequential Write (Random data)	461 MB/s{440 MiB/s} (64GB) 440 MB/s{420 MiB/s}	461 MB/s{440 MiB/s} (64GB) 440 MB/s{420 MiB/s}	461 MB/s{440 MiB/s} (64GB) 440 MB/s{420 MiB/s}
Random 4KiB IOPS Read(sustain)	80k (128GB, 256GB, 512GB) 50k (64GB)	80k (128GB, 256GB, 512GB) 50k (64GB)	80k (128GB, 256GB) 50k (64GB)
Write (max.)	35k (128GB, 256GB, 512GB) 25k (64GB)	35k (128GB, 256GB, 512GB) 25k (64GB)	35k (128GB, 256GB) 25k (64GB)
Drive Interface	SATA Revision 3.1		
Transfer Rate to Host	Up to 6Gb/s		
MTTF	1.5M hours		
External dimensions (WxDxH)	69.85 mm x 100.0 mm x 9.5 mm	69.85 mm x 100.0 mm x 7.0 mm	30.0 mm x 50.95 mm x 3.95 mm
Weight (typical)	50g (64GB, 128GB) 54g (256GB, 512GB)	48g (64GB, 128GB) 52g (256GB, 512GB)	7.4g (64GB, 128GB) 7.7g (256GB)

About Toshiba Storage Products
Toshiba Corporation and its affiliates offer one-of-a-kind global storage solutions, offering hard disk drives (HDDs), solid state drives (SSDs) and NAND flash memories – technologies that drive a wide range of consumer electronics, computer and automotive applications, as well as enterprise solutions for the global marketplace. Toshiba is a leader in the development, design and manufacture of mobile, consumer and enterprise hard disk drives and solid state drives. In North America, the Storage Products Business Unit of Toshiba America Electronic Components, Inc. markets high-quality storage peripherals to original equipment manufacturers, original design manufacturers, value-added resellers, value-added dealers, systems integrators and distributors worldwide. Inherent in the Toshiba storage family are the high-quality engineering and manufacturing capabilities that have established Toshiba products as innovation leaders worldwide. For more information, visit www.toshibastorage.com

About Toshiba Corp. and Toshiba America Electronic Components, Inc. (TAEC)
Through proven commitment, lasting relationships and advanced, reliable electronic components, Toshiba enables its customers to create market-leading designs. Toshiba is the heartbeat within product breakthroughs from OEMs, ODMs, CMs, VARs, distributors and fabless chip companies worldwide. A committed electronic components leader, Toshiba designs and manufactures high-quality flash memory-based storage solutions, solid state drives (SSDs), hard disk drives (HDDs), discrete devices, advanced materials, medical tubes,

custom SoCs/ASICs, imaging products, microcontrollers and wireless components that make possible today's leading smartphones, tablets, MP3 players, cameras, medical devices, automotive electronics, enterprise solutions and more.

Toshiba America Electronic Components, Inc. is an independent operating company owned by Toshiba America, Inc., a subsidiary of Toshiba Corporation, Japan's largest semiconductor manufacturer and the world's third largest semiconductor manufacturer (Gartner, 2011 Worldwide Semiconductor Revenue, March, 2012). Toshiba Corporation was founded in 1875 and today has over 490 subsidiaries and affiliates, with 203,000 employees worldwide. Visit Toshiba's web site at www.toshiba.co.jp/index.htm.

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1. One Gigabyte (1GB) means 10^9 = 1,000,000,000 bytes using powers of 10. A computer operating system, however, reports storage capacity using powers of 2 for the definition of 1GB = 2^{30} = 1,073,741,824 bytes and therefore shows less storage capacity. Available storage capacity (including examples of various media files) will vary based on file size, formatting, settings, software and operating system, such as Microsoft Operating System and/or pre-installed software applications, or media content. Actual formatted capacity may vary.
2. Toshiba Semiconductor & Storage Products Company defines "RoHS Directive" as the Directive 2002/95/EC of the European Parliament and of the Council of 27 January 2003 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.
3. Toshiba Semiconductor & Storage Products Company defines Halogen-Free/Antimony-Free solid state drive (SSD) or hard disk drive (HDD) products as those meeting all of the following requirements:
    (a) containing bromine (Br) and chlorine (Cl) in no more than 900 parts per million (ppm) by weight for each element, and containing bromine and chlorine in an aggregate amount not exceeding 1500 ppm by weight; and (b) containing no more than 1000 ppm antimony (Sb) by weight.