



Toshiba Memory Europe Unveils UFS Devices Utilizing 64-Layer, 3D Flash Memory

Düsseldorf, Germany, 29. November 2017 - Toshiba Memory Europe GmbH has today started sampling Universal Flash Storage (UFS) devices^[1] utilising Toshiba Memory Corporation's cutting-edge 64-layer, BiCS FLASH™ 3D flash memory^[2]. The new UFS devices meet performance demands for applications that require high-speed read/write performance and low power consumption, including mobile devices such as smartphones and tablets, and augmented and virtual reality systems.

The new line-up will be available in four capacities: 32GB, 64GB, 128GB and 256GB^[3]. All of the devices integrate flash memory and a controller in a single, JEDEC-standard 11.5 x 13mm package. The controller performs error correction, wear levelling, logical-to-physical address translation and bad-block management, allowing users to simplify system development.

All four devices are compliant with JEDEC UFS Ver2.1, including HS-GEAR3, which has a theoretical interface speed of up to 5.8Gbps per lane (x2 lanes = 11.6Gbps) while also suppressing any increase in power consumption. Sequential read and write performance^[4] of the 64GB device are 900MB/s and 180MB/s, while the random read and write performance

are around 200% and 185% better, respectively, than those of previous generation devices^[5]. Due to its serial interface, UFS supports full duplexing, which enables both concurrent reading and writing between the host processor and UFS device.

Notes:

* Company names, product names, and service names mentioned herein may be trademarks of their respective companies.

[1] Universal Flash Storage (UFS) is a product category for a class of embedded memory products built to the JEDEC UFS standard specification.

[2] Sample shipments of the 64GB device will start today with the rest of the line-up to gradually follow after December.

[3] Product density is identified based on the density of memory chip(s) within the Product, not the amount of memory capacity available for data storage by the end user. Consumer-usable capacity will be less due to overhead data areas, formatting, bad blocks, and other constraints, and may also vary based on the host device and application. For details, please refer to applicable product specifications.

[4] Read and write speeds are calculated as 1MB/s = 1,000,000bytes/s. Actual read and write speed may vary depending on the device, read and write conditions, and file size.

[5] Toshiba Memory Corporation's previous generation 64GB device "THGAF4G9N4LBAIR"

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About Toshiba Memory Europe

Toshiba Memory Europe GmbH (TME) is the European business of the Toshiba Memory Corporation (TMC). Our company offers a broad product line of high-end flash memory products, including SD Cards, USB sticks, micro SDs and embedded memory components, in addition to solid state drives (SSD). TME maintains offices in Germany, France and the United Kingdom. The company's president is Masaru Takeuchi.

For more information on the full range of TME's memory and SSD products please visit <http://toshiba.semicon-storage.com>

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