

Samsung Introduces World's First Universal Flash Storage (UFS) Removable Memory Card Line-up

*Offering up to 256-Gigabyte (GB) Capacity Universal Flash Storage (UFS) Removable
Memory Card Line-up, Offering up to 256-Gigabyte (GB) Capacity*

JULY 6, 2016 - Samsung Electronics, the world leader in advanced memory technology, today unveiled the industry's first removable memory cards based on the JEDEC Universal Flash Storage (UFS) 1.0 Card Extension Standard*, for use in high-resolution mobile shooting devices such as DSLRs, 3D VR cameras, action cams and drones. Coming in a wide range of storage capacities including 256, 128, 64 and 32 gigabyte (GB), Samsung's UFS cards are expected to bring a significant performance boost to the external memory storage market, allowing much more satisfying multimedia experiences.

“Our new 256GB UFS card will provide an ideal user experience for digitally-minded consumers and lead the industry in establishing the most competitive memory card solution,” said Jung-bae Lee, senior vice president, Memory Product Planning & Application Engineering, Samsung Electronics “By launching our new high-capacity, high-performance UFS card line-up, we are changing the growth paradigm of the memory card market to prioritize performance and user convenience above all.”

Samsung's new 256GB UFS removable memory card — simply referred to as the UFS card will provide greatly improved user experiences, especially in high-resolution 3D gaming and high-resolution movie playback. It provides more than five times faster sequential read performance compared to that of a typical microSD card, reading sequentially at 530 megabytes per second (MB/s) which is similar to the sequential read speed of the most widely used SATA SSDs. With this UFS card, consumers have the ability to read a 5GB, Full-HD movie in approximately 10 seconds, compared to a typical UHS-1 microSD card, which would take over 50 seconds with 95MB/s of sequential reading speed. Also, at a random read rate of 40,000 IOPS, the 256GB card delivers more than 20 times higher random read performance compared to a typical microSD, which offers approximately 1,800 IOPS.

When it comes to writing, the new 256GB UFS card processes 35,000 random IOPS, which is 350 times higher than the 100 IOPS of a typical microSD card, and attains a 170MB/s sequential write speed, almost doubling the top-end microSD card speed. With these substantial performance improvements, the new 256GB UFS card significantly reduces multimedia data downloading time, photo thumbnail loading time and buffer clearing time in burst shooting mode, which, collectively, can be particularly beneficial to DSLR camera users. To shoot 24 large/extra fine JPEG photographs (1,120 megabyte (MB)-equivalent) continuously with a high-end DSLR camera, the 256GB UFS card takes less than seven seconds, compared to a UHS-1 microSD card which typically takes about 32 seconds, at 35MB/s.

To achieve the highest performance and most power-efficient data transport, the UFS card supports multiple commands with command queuing features and enables simultaneous reading and writing through the use of separately dedicated paths, doubling throughput.

As the leading memory storage provider, Samsung has been aggressive in preparing UFS solutions for the marketplace, while contributing to JEDEC standardization of the *Universal Flash Storage 2.0* specification in September 2013 and the Universal Flash Storage (UFS) 1.0 Card Extension standard in March 2016. Following its introduction of the industry-first 128GB

embedded UFS chip in January 2015, the company successfully launched a 256GB embedded UFS memory for high-end mobile devices in February of this year. As of earlier this month, Samsung also completed the Universal Flash Storage Association** (UFSA)'s certification program that evaluates electrical and functional specifications for compatibility of a UFS card, and Samsung's new UFS card products were approved as UFSA-certified UFS cards with the right to use the official UFS logo for the first time in the industry.

**Samsung has taken a leading role in standardization of JEDEC Universal Flash Storage (UFS) 1.0 Card Standard, and filed seven design patent applications to USPTO (US Patent and Trade Office) which the company disclosed to all JEDEC members under the RAND (reasonable and non-discriminatory licensing) condition that allows manufacturers to develop UFS card products without royalty. Royalty payment usually encompasses a significant portion of other types of removable card manufacturing. For more information, please visit <http://www.jedec.org/news/pressreleases/jedec-publishes-universal-flash-storage-ufs-removable-card-standard/>*

***UFSA announced the release of a Universal Flash Storage (UFS) Compliance Test Matrix (CTM) in April, 2016. For more information, please visit <https://ufsa.org/>*