SD Association

SD ASSOCIATION ADDS HIGHER APP PERFORMANCE CLASS AND LOW VOLTAGE SIGNALING TO EXPAND SUPPORT FOR MOBILE DEVICES

A2 features ramp up app performance on cards, give consumers more choices while Low Voltage Signaling meets latest low-power mobile chipset requirements

BARCELONA – Mobile World Congress Booth CS168— February 27, 2017 — SD Specification 6.0 expands support for mobile devices with Application Performance Class 2 (A2) more than doubling random read and write speeds guaranteed in the entry level App Performance Class 1 (A1), and new low voltage signaling (LVS) SD memory cards availability. These new SD memory cards maintain full backwards compatibility, an incredible technical feat that maintains consumer and manufacturer value with the billions-strong SD install base.

The SDA introduced A1, the basic App Performance Class in November 2016 as its first and basic class. The new A2 is directed at special cases where hosts require even higher levels of performance. Introduced in SD 6.0 specification, A2 is the next class level and provides more flexibility in the market for cost-performance optimization based on the product, the application of the product or market needs. The newly introduced functions of Command Queuing, Cache, and Self-Maintenance are SD protocol functions that enable higher performance levels. A video is available to learn more about both App Performance Classes.

A2 memory cards deliver app-running performance by meeting or exceeding the following levels under specified conditions:

- Random Read Input-Output access Per Second (IOPS) of 4000
- Write IOPS of 2000
- Sustained Sequential performance of 10MB/s

The latest SD specification also allows SD host product manufacturers to offer devices that only support 1.8V Low Voltage Signaling (LVS), which complements the latest chip designs for higher performance and less power consumption. LVS SD memory cards maintain the SDA's commitment to backwards compatibility with legacy host products. All memory cards supporting A2 will also support the new LVS signaling.

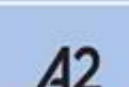
"The new features in SD 6.0 add significant performance improvements over previous versions of SD memory cards, taking memory card functionality to a new level," said Stuart Robinson, director at Strategy Analytics. "The new SD standard is perfect for users with limited memory on their device, allowing them to run apps directly from a microSD memory card. SD cards are already used in billions of devices around the world and this latest initiative will help to maintain SD as the preferred choice for memory cards."

Mobile phones and mobile computing users can choose the best SD memory card to run applications on their mobile devices by matching the App Performance Class and

LVS symbol on the memory card with the corresponding symbol on the device or device packaging.

“The SDA pairs innovation and practicality, ensuring the market has what it wants and needs and consumers aren’t left frustrated with investments in products with planned obsolescence,” said Brian Kumagai, SDA president. “Interoperability and compatibility have been fundamental to our innovation path, including with the high-performing A2 and LVS memory cards.”

The App Performance Class symbol provides product manufacturers with a way to communicate app-running requirements before users buy an SD memory card.

Application Performance Class	Pictograph	Minimum Random Read	Minimum Random Write	Minimum Sustained Sequential Write
Class 1 (A1)*		1500 IOPS	500 IOPS	10MBytes/sec
Class 2 (A2)**		4000 IOPS	2000 IOPS	10MBytes/sec

New features supporting A2 performance
The following features are required on all products that indicate A2 performance:

- *Command Queue*
  - Contributes mainly to random read performance
  - Multiple tasks can be handled at one time with arbitrary order
  - New tasks can be assigned during data transmission
- *Cache function*
  - Contributes mainly to random write performance
  - Card may use higher speed volatile memory to cache the host data during memory card access operation
- *Self-Maintenance*
  - Contributes to better memory access performance
  - Allows internal background data management
  - May be initiated either by card or by the host based on the card’s internal needs

Low Voltage Signaling
A low voltage symbol identifies LV Interface supported SD products for users. An LVS host will bear the LV symbol somewhere on the product, package or manual. LVS

device users need to use a corresponding SD memory card with an LV symbol for their LV-marked device. On the other hand, an LVS card is usable by any host, including hosts that do not carry the LV symbol.

- The LVS card is fully backwards compatible and usable by both conventional hosts using 3.3V signaling or by LVS hosts that operate only with 1.8V signaling

- An LVS host may operate only with the new LVS cards and conventional UHS-II cards are supported if a UHS-II mode is available by the host device

App Performance Class 2 card example:

Low Voltage Signaling card example:

A new white paper, "Mobile Device Innovations: Application Performance Class Expansion and New Low Voltage Signaling for SD Memory Cards," provides more details on the new features, capabilities and market requirements. More information is available on our website.

Find the SD Association at Mobile World Congress February 27 through March 2, 2017, in Booth CS168 in Barcelona.

SD Association

The SD Association is a global ecosystem of nearly 900 technology companies charged with setting interoperable SD standards. The Association encourages the development of consumer electronic, wireless communication, digital imaging and networking products that utilize market-leading SD technology. The SD standard is the number one choice for consumers and has earned more than 80 percent of the memory card market with its reliable interoperability and its easy-to-use format. Today, smart phones, tablets, Blu-ray players, HDTVs, audio players, automotive multimedia systems, handheld PCs, digital cameras and digital video cameras feature SD interoperability. For more information about SDA or to join, please visit the Association's website, https://www.sdcard.org.

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