

Solid State Drive (SSD)

TDK launches CAS1B series of serial ATA 6Gbps with high reliability CFast Card Type SSDs

- Incorporates new TDK GBDriver GS1 controller for high reliability SATA Gen. 3 SSDs
- Integrated power supply protection circuit
- Support for SLC, MLC, pSLC flash memory

November 16, 2015

TDK Corporation announces the new CAS1B series of 6 Gbps serial ATA compatible CFast type solid state drives for industrial applications, featuring the NAND flash memory controller chip GBDriver GS1. The new products will be available from January 2016.

Recently, the use of highly reliable and robust card type storage devices with high capacity is increasing in industrial applications, as operating systems tend to have higher overheads and ease of handling is also an important factor.

In response to such demands, TDK has developed a new series of CFast cards, which boast 3.2 times faster read and 1.9 faster write speed than the existing CAG3B series, while maintaining the excellent reliability that we are renowned for.

Industrial applications also increasingly call for solid state drives with MLC NAND type memory. In such cases, improved data retention capability as well as high reliability becomes important considerations along with the regular benchmark test results.

To meet such requirements, the new controller not only features the recovery and refresh functions implemented by the existing GBDriver series of controllers, but also comes standard with a highly acclaimed power interruption tolerance algorithm as well as an integrated power supply protection circuit. This assures highly robust data reliability both with SLC and with MLC NAND type flash memory.

The standard lineup also provides the choice of pSLC flash memory, which offers higher robustness than MLC and lower cost per bit than SLC, resulting in a good balance of reliability and cost.

Data security has also been enhanced. In addition to the standard ATA security complement, AES^{*1} 128-bit and 256-bit encryption and a TDK proprietary security function are also available. This makes it possible to store data in the NAND type flash memory in encrypted form, to guard against the risk of data leaks and tampering, resulting in highly robust storage security.

The new CAS1B series will be exhibited at the "Embedded Technology 2015" and "IoT Technology 2015" to be held at the Pacifico Yokohama from November 18 to 20 this year.

Glossary

- *1: AES: Advanced Encryption Standard. A block encryption method registered as United States Department of Commerce Federal Information Processing Standard FIPS PUB197.
- *2: With onboard SLC flash memory. May vary depending on system environment.

Main applications

- Factory automation equipment such as semiconductor manufacturing equipment, NC machine tools, sequencers, programmable logic controllers, panel computers, and embedded CPU boards
- Railway and transport equipment such as automated ticket gates, automated ticket vending machines, commuter pass vending machines, train operation management systems, automated air ticket vending machines, and automated check-in systems
- Cashless registers and other point-of-sales (POS) equipment, convenience store and kiosk terminals, ATMs and other banking terminals
- Terminals and thin-client computers, SATA RAID SSD installations and other IT equipment for cloud computing systems
- Automotive equipment such as car navigation systems, digital tachographs, drive recorders, and rear-view monitors
- Office equipment such as multi-function printers (MFPs), commercial projectors, telephone conferencing systems, and electronic blackboards
- Amusement devices such as karaoke on demand, arcade games, and game consoles
- Advertising display equipment such as digital signage, electronic billboards, and electronic point-of-purchase (POP) displays
- Medical and measuring instruments and nursing care equipment such as diagnostic imaging systems, blood analysis equipment, medical PCs, electronic patient records systems, DNA microarray systems, automatic biochemistry analyzers, remote medical care devices, and automated care devices
- Base station equipment for 4th generation (4G) mobile data communication systems such as LTE-Advanced/WiMAX2 and other communications and broadcasting equipment and information system devices
- Smart grid equipment such as smart electricity meters, power grid infrastructure equipment, automated power equipment control systems, energy management systems, and building air conditioning systems
- Security and surveillance equipment such as biometric authentication systems, entry/exit control systems, and security terminals for surveillance cameras Disaster prevention related equipment such as earthquake early warning systems and household fire detectors

Main features

1. Uses GBDriver GS1 NAND Flash Memory Controller Developed by TDK

The memory controller chip determines SSD performance and data reliability. The drives use the GBDriver GS1 developed by TDK. By reflecting the latest NAND flash memory specifications and developments in the controller design, TDK enhances performance of solid state drives and ensures compatibility among flash memory generations. This means that the same product line can meet the flash storage needs of industrial and embedded applications, and the same configuration can be used to fit various flash storage needs and offer enhanced replacement products.

2. High-Speed Access Combined With High Data Reliability

Compliant with Serial ATA Revision 3.1 Specification. Compatible with SATA Gen. 3 (6.0 Gbps) and NCQ commands. Supports 360 MByte/second read access and 110 MByte/second write access^{*2}.

3. Standard Support for Products Using SLC NAND, MLC NAND and pSLC NAND

Besides products using the latest SLC NAND type flash memory, MLC NAND products and pSLC NAND products are also included in the standard lineup. This allows customers to easily select the optimal solution for every need.

4. Global Static Wear Leveling

TDK's proprietary global static wear leveling algorithm counts the number of times each memory block is programmed (erased) and replaces all blocks uniformly. Static blocks such as for the OS are also periodically leveled, which drastically improves the lifespan of the installed flash memory. The range for static wear leveling can be freely set. (In this case, dynamic wear leveling is used for other areas.)

5. Improved Power Interruption Tolerance

A power interruption tolerance algorithm on the SSD onboard controller and an internal power supply protection circuit reliably prevent collateral data errors such as corruption of data other than the data being written if power is interrupted when writing data. This provides robust reliability against sudden power supply problems.

6. Error Recovery

The auto-refresh function reads all data of the flash memory including little used areas and automatically performs error correction if required. This guards against data loss due to read disturbance errors and data retention errors. Auto refresh processing is performed in the background, so even when performing correction processing, there is virtually no delay in command response.

7. Data Delete Function

A function for specifying a data range and completely deleting all data in it is also available. This is useful to protect personal information in keeping with a privacy policy.

8. Security Functions

(a) AES 128/256-bit encryption

Encryption support has been extended to AES 256-bit. The 128/256-bit AES encryption function automatically encrypts data when writing to the NAND flash memory, to prevent leaking of and tampering with personal data and confidential information. (Option)

(b) Protection function

Incorporation of an ATA standard protection function allows customers to set and remove a password to implement independent authentication and protect important data.

(c) TDK proprietary security function

Mutual authentication of host and SSD makes it possible to block access and response by unauthorized third parties through spoofing etc. (Contract for protection of confidential information required separately.)

9. Support for SMART Command

The number of times all memory blocks have been programmed (erased) can be obtained using the SMART command, which allows for easy determination of the flash memory status and facilitates appropriate lifespan management. Proprietary software from TDK can be used for this purpose free of charge.

10. Solution Support

TDK has independently developed and marketed the GBDriver series of NAND type flash memory controllers since 2000. We provide technical support to customers in Japan and overseas backed up by advanced proprietary technologies, including dispatch of field application engineers and support for implementation of reliability monitoring functions, for which there is strong demand in the industrial equipment embedded flash storage market.

Production and marketing schedule

- Production location: Taiwan
- Production capacity: 10,000 units per month
- Start of production: December 2015

About TDK Corporation

TDK Corporation is a leading electronics company based in Tokyo, Japan. It was established in 1935 to commercialize ferrite, a key material in electronic and magnetic products. TDK's portfolio includes electronic components, modules and systems* marketed under the product brands TDK and EPCOS, power supplies, magnetic application products as well as energy devices, flash memory application devices, and others. TDK focuses on demanding markets in the areas of information and communication technology and consumer, automotive and industrial electronics. The company has a network of design and manufacturing locations and sales offices in Asia, Europe, and in North and South America. In fiscal 2015, TDK posted total sales of USD 9.0 billion and employed about 88,000 people worldwide.

* The product portfolio includes ceramic, aluminum electrolytic and film capacitors, ferrites, inductors, high-frequency components such as surface acoustic wave (SAW) filter products and modules, piezo and protection components, and sensors.

The text of this release and related images can be downloaded from
http://www.global.tdk.com/news_center/press/201511162055.htm

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