

Serial ATA 3Gbs Compatible Industrial use embedded mSATA type Solid State Drive (SSD) module SMG3B Series

Conformity to RoHS Directive

mSATA Type SSD Modules with TDK SSD Controller GBDriver RS3
Featuring Data Randomizer and Auto Refresh Function
1GB, 2GB, 4GB, 8GB, 16GB, 32GB, 64GB

The TDK SMG3B Series includes fast, highly reliable mSATA type compact SSD modules with excellent speed performance, data reliability, storage lifespan, and data security. At about 30mmx50mm, they save space, but come in capacities of up to 64GByte. In addition to an effective speed of 170MByte/sec, strong error correction of up to 44bit ECC is possible to ensure excellent data reliability.

In addition, using our original algorithms for our company's GBDriver RS3 SSD controllers, these mSATA type flash modules are highly resistant to sudden power supply problems, making them ideal for use in vehicles or for industrial use. A data randomizer function and auto refresh function are also utilized to reduce the risk of data errors.

The lifespan of SSDs has been greatly improved. Single Level Cell (SLC) NAND type flash memory is used along with our "TDK Smart Swap" advanced static wear-leveling algorithm overwriting dispersion method to achieve top-class storage lifespans. At the same time, "TDK SMART" lifespan diagnostic software allows for the number of erased (programmed) for all memory blocks to be acquired as smart information in real time, which improves maintenance and makes it easier to grasp the module replacement time.

Security functions have also been enhanced. By using the ATA Trim command during replacement or disposal, complete deletion of data is possible. In addition, using ATA standard security functions, a password can be set by the user to prevent data leakage, falsification, and unauthorized copying. The AES 128Bit encryption function allows for data to be encrypted when written to the flash memory, making data analysis by reverse engineering impossible.

TDK'S HIGHLY RELIABLE mSATA TYPE SSD SMG3B SERIES FUNCTIONAL FEATURES

High-speed performance: SATA 3Gbps-Compatible		
High reliability	Long lifespan	Security
High durability Single Level Cell (SLC) flash memory		AES128bit encryption function
Strong ECC function	Global static wear leveling function TDK Smart Swap	ATA security: password lock, secure erase
Data randomizer: lesser ECC booting		TDK original password function (Read/Write Protect)
Auto refresh function	Small writes accumulation	ATA Trim command
Auto recovery function	Lifespan management by SSD life monitor software TDK SMART	
Algorithm against powerdisconnection		



- Conformity to RoHS Directive: This means that, in conformity with EU Directive 2002/95/EC, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.

- All specifications are subject to change without notice.

FEATURES

- Compatible with TDK SSD controller IC GBDriver RS3.
- Thin, mini type mSATA SSDs compatible with Serial ATA Standard Rev. 2.6 (Gen1:1.5Gbps; Gen2:3.0Gbps). *1 High-speed access with read speed of 170MByte/sec and write speed of 70MByte/sec.*2
- Equipped with 8bit, 15bit/512Byte, 30bit, 44bit/1KByte ECC: Automatically selected by the flash memory.
- Equipped with an advanced global static wear leveling system "TDK Smart Swap" algorithm. The SSD lifespan has been greatly enhanced and programming is dispersed for all areas of memory.*3 (As reference, a flash memory with a 64GByte capacity can be programmed (erased) 6.2 billion times. This is equivalent to 10-times programming (erasing) per second over 20-year period.)*3
- High durability against power disconnection due to the TDK GBDriver RS3 algorithm against power disconnection and the power backup circuit in SSD.
- The lifespan analysis program "TDK SMART" is included. It facilitates the management of remaining SDD lifespan, and the RAS (Reliability, Analysis & Serviceability) function can be enhanced.
- Equipped with a function to set the number of total sectors. CHS parameters can also be customized, facilitating the system introduction.*5
- Equipped with a data randomizer function. When data is written, the data pattern is randomized to eliminate data unevenness, which reduces bit errors.
- Equipped with an auto-refresh function. Data in the flash memory is read regularly, bit errors are detected, and data is automatically recovered as needed. This is done in the background, so response to commands is not delayed even when correction is being executed.
- Supports ATA Trim commands. These commands allow for data to be completely deleted, which ensures safety during replacement and disposal.
- Supports a protect function conforming to ATA standards.
- TDK's original password lock function allows for the user to set or cancel a password, and allows for the user to specify the read protect / write protect area.
- Equipped with AES (Advanced Encryption Standard) 128bit function. Data is encrypted when it is recorded in order to prevent falsification, leakage, and unauthorized copying of personal and confidential information.*6
- Compatible with NCQ (Native Command Queuing).
- A dedicated FAE (Field Application Engineer) registration system provides fast and reliable solutions such as for system compatibility verification and customizing.
- These Solid State Drives are RoHS compliant. The components, lead terminals, etc. are all free from hazardous substances prohibited by the RoHS Directives of the EU (European Union).

*1 mSATA is a standard created by the Serial ATA International Organization (SATA-IO), and connection is possible using a connector the same size as mini PCI Express.

*2 Dependent on flash memory connection configuration and system environment.

*3 The scope of static wear leveling execution can be customized. (Outside the scope of static wear leveling execution, dynamic wear leveling is executed).

*4 This applies to a product equipped with an SLC flash memory with a structure of 8 KByte/page.

*5 Setting the number of total sectors and CHS parameters is optional.

*6 AES 128bit: Advanced Encryption Standard standardized by U.S. Federal Information Processing Standard (FIPS) PUB197.

MAIN APPLICATIONS

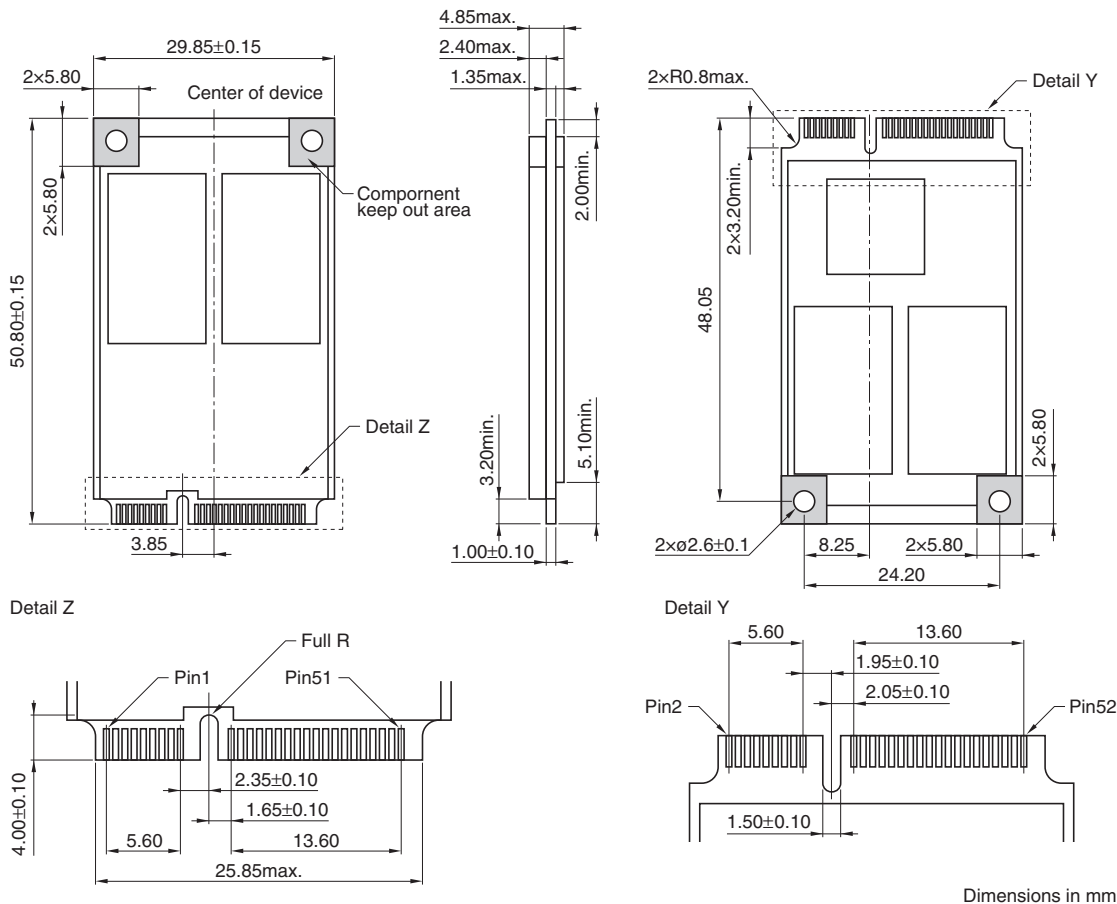
- Replacing HDDs with SSDs or building SATA RAID system.
- Usages storage devices requiring a high frequency of data rewriting such as POS systems. Usages requiring high reliability and durability for long-term use such as Smart Grid Systems and base stations, and also requiring lifespan monitoring functions such as replacement time detection.
- For WIN or Android OS, system or user data storage for home information appliances: e.g. netbooks, BD devices, digital TV, STB
- Usages requiring vibration resistance, energy conservation, and compact size such as Green IT equipment, medical equipment, logistics systems, and machine tools.
- Usages requiring strict data security such as terminals for financial institutions and digital signage.

APPLICATION EXAMPLES

- Thin client PC, tablet PC, SATA RAID SSD, and other IT devices, as well as cloud computing systems.
- General marine navigation equipment: fish finders, GPS plotters, satellite compasses, Navtex, Navi Net 3D navigation radar, VTS (Vessel Transportation System) devices and overland AIS(Automatic Identification System), Inmarsat, weather FAX machines, National Oceanic and Atmospheric Administration, and Electronic Chart Display and Information Systems (ECDIS).
- General OA equipment: multifunction printers (MFPs), business use projectors, TV conference systems, and electronic blackboards.
- Entertainment equipment such as online karaoke and amusement arcades.
- Advertising display equipment such as digital signage and digital posters.
- General FA equipment such as semiconductor manufacturing equipment, NC machine tools, sequencers, PLCs, panel computers, and embedded CPU boards.
- General transportation facility equipment such as automatic ticket vending and checking, and commuter pass-vending machines, train traffic control systems, automatic airline ticketing machines, and automatic check-in machines.
- Financial institution terminals such as cash registers and other POS (point-of-sales) equipment, convenience stores and kiosk terminals, electric money terminals including Suica, and ATMs (Automatic Teller Machines).
- General medical equipment and data analysis equipment: imaging CTs, blood analyzers, medical computers, electronic medical records, DNA micro array synthesizers, automated biochemical analyzers, remote medical systems, and automatic nursing-care systems.
- General communication/broadcast and information system equipment for communication base station: fourth-generation (4G) mobile phone data communication systems(LTE-Advanced/WiMax2), data broadcasting system supporting digital broadcasting, VCR-editing devices, digital mixing consoles, digital multi-track recorders, master sound displays, multi-format routing switchers, broadcasting equipment including FPU devices, and information system equipment.
- General smart grid system equipment: smart meters, power grid communication infrastructure, next-generation power grid systems, power equipment control systems, energy management systems and building A/C systems.
- General security terminals and equipment such as digital signage, biometric authentication systems, room entering/leaving management systems, and surveillance cameras.
- Disaster prevention equipment such as earthquake notification systems, residential fire alarms, and other devices including simulators for danger avoidance, training and disaster prevention.

SHAPES AND DIMENSIONS

mSATA type SSD module



SPECIFICATIONS

Series	Serial ATA3Gbps mSATA type Solid State Drive (SSD) module RS3 Series	
Product name	SMG3B Series	
Data capacity	1GB/2GB/4GB/8GB/16GB/32GB/64GB	128GB
Size	mSATA type SSD module	
Memory type	SLC(Single Level Cell) NAND Flash Memory	MLC(Multi Level Cell) NAND Flash Memory
Controller	TDK GBDriver RS3	
Interface	Serial ATA Revision 2.6	
Transfer mode	SATA Gen1: 1.5Gbps, Gen2: 3.0Gbps	
Transfer speed*	Read(max.)	170MByte/sec (Currently under measurement)
	Write(max.)	70MByte/sec (Currently under measurement)
Error-Correcting function(ECC)	8bit/15bit ECC (512Byte), 30bit/44bit ECC (1KByte)	
Endurance(reference)	With/Without fixed area	With/Without fixed area
	Effective blocks \times 50,000 times (Ex: 6.2billion for 64GB)	Effective blocks \times 1,500 times (Ex: 180million for 128GB SSD)
Operating temperature range	0 to 70°C	
Ambient storage temperature range	-25 to +85°C	
Storage/Operation humidity range	0 to 90(%) RH [No condensation]	
Power supply voltage	3.3V \pm 5%	
Acquired standards	CE/FCC/VCCI	
Environmental specifications	RoHS compliant	
Country of origin	Taiwan	

* Measured by CrystalDiskMark 3.1 in 4ch Interleaved mode.

The above performance may not be achieved depending on the actual usage environment and conditions of the user.