



*“Origami”* SSD

# HALF SLIM

SATA 3Gbps Half Slim **SHG2A Series**

## Embedded Solid State Drives Half Slim SSDs

TDK's SHG2A series of Half Slim SSDs are half the size of 1.8 inch HDDs with a maximum data capacity of 32GB. They connect using a standard SATA cable, so they are easy to embed in system equipment. The SHG2A series is equipped with the GBDriver® RS2 SSD controller, which was developed by TDK and is made in Japan. This series includes a powerful error correction ability that can be extended up to 15bit/512byte ECC, resulting in high data reliability. In addition, an internal power backup circuit are included, making these SSDs resistant to sudden power interruptions. The flash memory is equipped with long lifespan Single Level Cell (SLC) NAND. In addition to the advanced Global Static wear leveling function of the GBDriver® RS2, these are top-level, long-lasting SSDs.



□ **BASIC CHARACTERISTICS / RATINGS**

Data capacity	1GB to 32GB
Power supply voltage	5.0V±10%
Ambient operating temperature	0 to +70°C (-40 to +85°C)
Ambient storage temperature	-25 to +85°C (-40 to +85°C)
Consumption current	85mA (5.0V Single mode Read Write)
	150mA (5.0V 2ch mode Read Write)
	240mA (5.0V 4ch mode UDMA)
	less than 30mA
	(5.0V Slumber)

## High-Speed, High-Reliability Serial ATA 3Gbps Half Slim SSDs (Solid State Drives)

Complies with RoHS directives

# SHG2A Series

1GB/2GB/4GB/8GB/16GB/32GB

### TDK SSD Controller IC GBDriver® RS2 Employed Internal Power Backup Circuit Equipped High-Reliability SATA II Half Slim SSD

TDK's high-reliability SSD SHG4A series, despite being approximately as compact as 54 x 40mm; almost half the size of a 1.8inch HDD, can handle a range of capacity up to 32GB for SLC type NAND flash memory.

The small SATA flash drive is equipped with an internal power backup circuit and processes everything at the high level, including data reliability, endurance and data security.

Moreover, the data randomizer, auto refresh and read retry functions which are crucial to the latest flash control, are also equipped.

Thanks to the auto recovery function and power backup circuit, this series provides data reliability at the highest levels in the industry.

Furthermore, an advanced static wear leveling algorithm levels the

programming (erasing) times of the flash memory in all areas of the NAND-type flash memory.

The endurance of NAND type flash memory can be fully used.

Also, SSD life monitor software "TDK SMART", allows the number of times of programming (erasing) for all memory blocks to be acquired in real time as SMART information, thus enabling the drive lifespan to be quantitatively known. At the same time, AES128bit encryption function is also implemented.

The prevention of data leakage, alteration and unauthorized copying ensures high-grade storage security.

\* Standards for Half-Slim SSD (Solid State Drive) have been determined by the JEDEC and Serial ATA International Organization. It is possible to use standard SATA connectors.

#### □ FEATURES

- Employed TDK SSD controller GBDriver® RS2.
- Serial ATA Standard Rev.2.6-compliant. (Gen1: 1.5Gbps / Gen2: 3.0Gbps)  
Read 95MB/s, Write 40MB/s achieved. (\*1)
- Equipped with 15bit/512Byte ECC.
- TDK GBDriver RS2 algorithm and an internal power back up circuit in SSD reduces the risk of collateral data errors such as corruption of data other than the data being written if power is interrupted when writing data.
- This series employs SLC (Single Level Cell) NAND Flash. Highly reliable and high endurance Half Slim SSDs with long lifespans.
- Equipped with TDK Global Static wear leveling algorithm (TDK Smart Swap). This algorithm counts the number of times each memory block is erased (programmed) and replaces blocks uniformly, which drastically improves the lifespan of the installed flash memory.  
Even at a rate of 10 erases per second, this equates to an expected service life of 10 years. (\*2)
- SSD life monitor software "TDK SMART" is included. Drive life span can be checked quantitatively in real time, allowing easy maintenance.
- Equipped with a function to set the number of total sectors. CHS parameters can also be customized. (\*3)
- Equipped with an advanced encryption function AES128bit (CBC Mode). Data is automatically encrypted and recorded to the memory, which prevents data leakage and falsification.
- Supports security functions based on ATA standards. This function allows customers to set and remove a password. By combined the AES encryption function, it is possible to prevent unauthorized copying.
- A dedicated FAE (Field Application Engineer) system provides customers with registered technical support engineers, and fast and reliable Half Slim SSD solutions such as for system compatibility verification and customizing.
- Complies with RoHS directives. The components, lead terminals, etc. are all free from hazardous substances prohibited by the RoHS Directives of the EU (European Union).

(\*1) Dependent on flash memory connection configuration and system environment.

(\*2) This applies to a product equipped with an SLC flash memory with a structure of 4KByte/page. It is also possible to customize the execution range for static wear leveling. In such cases, dynamic wear leveling is used for the execution range outside of static wear leveling.

(\*3) Setting the number of total sectors and CHS parameters is optional.

#### □ EXAMPLES OF APPLICATIONS

- Replacing Hard Disk Drives (HDDs) and configuring SATA RAID systems and Cloud SSD systems
- IT equipment: netbooks, thin clients, tablet computers, e-book readers, etc.
- Vehicle devices: car navigation systems, portable navigation devices (PNDs), digital tachographs, ETC equipment, ITS devices, drive recorders, rear-view camera systems, etc.; traffic control system devices: traffic enforcement cameras, N systems (automatic vehicle number reading devices), etc.
- General OA equipment: multifunction printers (MFPs), label printers, barcode printers, business use projectors, electronic blackboards, etc. and DPE photographic development lab equipment.
- Advertisement display devices, terminal: digital photo frames, digital poster, electronic billboards electronic POPs, etc.
- Entertainment equipment: online karaoke, amusement arcades, etc.
- Energy measurement monitoring systems: smart meters, power grid communication infrastructure, auto power control systems, distribution boards., etc.; general smart grid system equipment: building A/C systems, network devices, etc.
- General FA equipment: semiconductor manufacturing equipment, NC machine tools, FA robots, mold injection machines, sequencers, PLCs (Programmable Logic Controller), panel computers, box computers, embedded CPU boards, etc.
- General transportation facility equipment: automatic ticket checking machines, automatic ticket vending machines, commuter pass-vending machines, train traffic control systems, automatic airline ticketing machines, automatic check-in machines, etc.
- Financial institution terminals and vending machines: cash registers and other POS (Point of Sales) equipment, convenient store and kiosk terminals, Felica/Suica terminals, ATMs, etc.
- General marine navigation equipment: fish finders, GPS plotters, satellite compasses, Navtex, Navi Net 3D navigation radar, VTS (Vessel Transportation System) devices and overlaid AIS (Automatic Identification System), Inmarsat, weather FAX machines, National Oceanic and Atmospheric Administration, and Electronic Chart Display, Information Systems (ECDIS), etc.
- General medical equipment, data analysis equipment, and analysis measurement equipment: ultrasound and X-ray imaging CTs, DNA analysis equipment such as DNA micro array synthesizers and DNA sequencers, blood analyzers, automated biochemical analyzers, medical computers, electronic medical records, electrocardiograms, remote medical equipment using 3D internet systems, etc.
- General broadcast and wireless information system equipment for communication base stations: LTE (Super 3G) third generation mobile phone data communication systems, IP simulcast radios, etc.
- General security terminals and security equipment: digital signage, biometric authentication systems, entrance control systems, surveillance cameras, security recorders, security camera facial recognition systems, etc.
- General disaster prevention equipment: earthquake early warning systems, residential fire alarm devices, etc.

\* GBDriver® is a trademark or registered trademark of TDK Corporation.

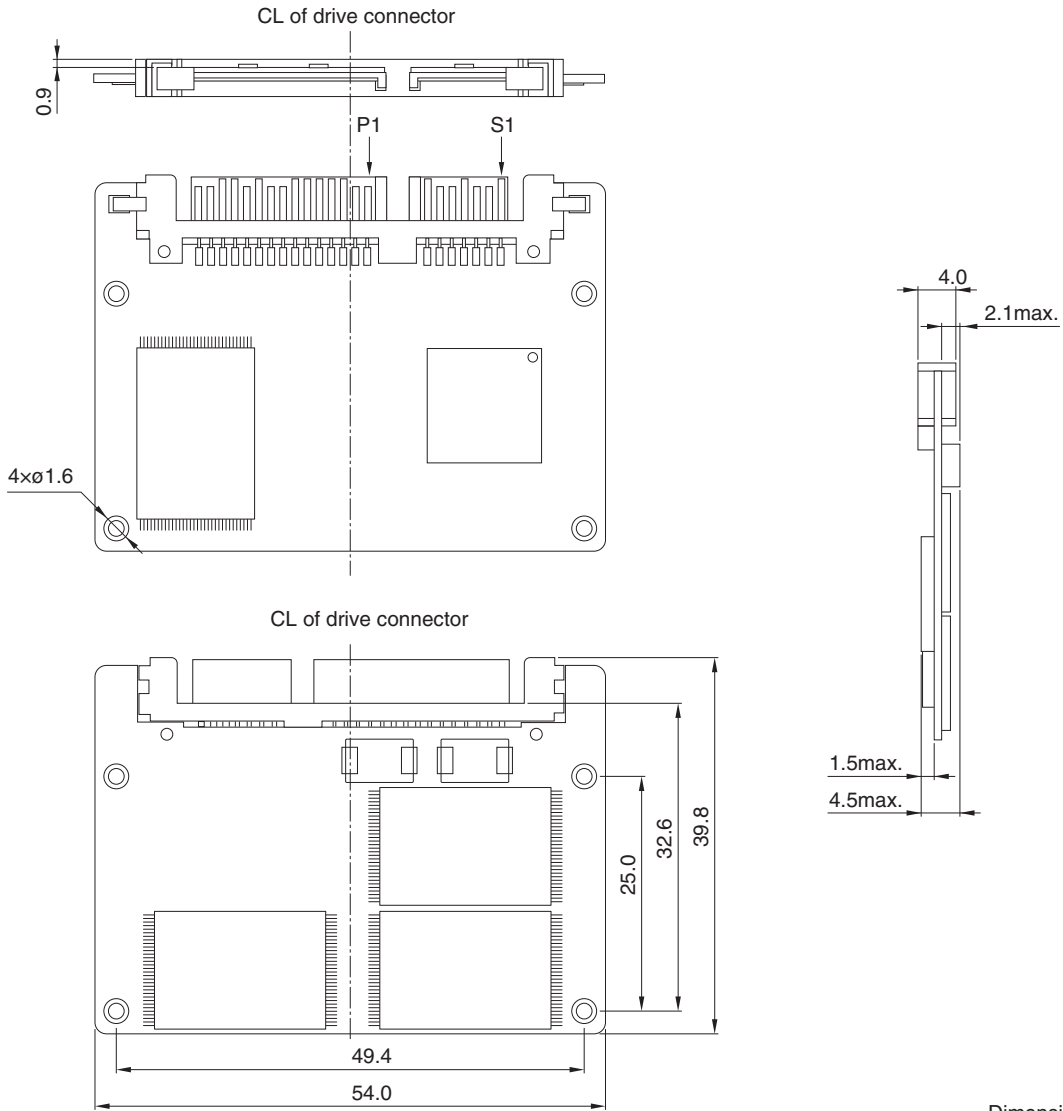
• Complies with RoHS directives :

This means that, in conformity with EU Directive 2011/65/EU, lead, cadmium, mercury, hexavalent chromium, and specific bromine-based flame retardants, PBB and PBDE, have not been used, except for exempted applications.



Please be sure to request delivery specifications that provide further details on the features and specifications of the products for proper and safe use. Please note that the contents may change without any prior notice due to reasons such as upgrading.

□ SHAPES AND DIMENSIONS



Dimensions in mm

□ CHARACTERISTICS

Series	SHG2A Series
Data capacity	1GB/2GB/4GB/8GB/16GB/32GB
Form factor	Half Slim Type SSD
Memory type	SLC (Single Level Cell) NAND Flash Memory
Controller	TDK GBDriver® RS2
Interface	Serial ATA Revision 2.6
Transfer mode	SATA Gen1: 1.5Gbps, Gen2: 3.0bps
Transfer speed* Read (max.)	95MByte/sec
Write (max.)	40MByte/sec
Error check and correction (ECC)	15bit/512Byte
Power supply voltage	5.0V±10%
Ambient operating temperature	0 to +70°C [-40 to +85°C Industrial Option]
Ambient storage temperature	-25 to +85°C [-40 to +85°C Industrial Option]
Storage/Operating humidity	0 to 90(%)RH [No condensation]
Conformed standards	CE/FCC/VCCI
Environmental specifications	RoHS compliant

\* In 4ch Interleaved mode, measured by CrystalDiskMark 3.0. The speed may vary depending on the actual use environment/conditions.

□ ENDURANCE (Expected P/E cycles)

Data Capacity	Part No.	Expected Endurance (Unit: Million times)	Allowable accesses per second according to age of equipment (When operating 24 hrs/d, 365 ds/yr)		
			1 year	5 year	10 year
1GB	SHG2A01GVAHB <b>C</b> S-SA	197	6.25	1.25	0.62
2GB	SHG2A02GVBH <b>C</b> S-SA	394	12.49	2.50	1.25
4GB	SHG2A04GVDH <b>C</b> S-SA	788	24.99	5.00	2.50
8GB	SHG2A08GVDH <b>C</b> S-SA	1,576	49.97	9.99	5.00
16GB	SHG2A16GVDH <b>C</b> S-SA	3,152	99.95	19.99	9.99
32GB	SHG2A32GLDH <b>C</b> S-SA	3,152	99.95	19.99	9.99

• The above products have an operating temperature of 0 to +70°C. For products with an operating temperature of -40 to +85°C, convert the blue letter "C" in the product name to "W".  
 (Example: SHG4A04GVDB**C**S-SA [0 to +70°C product]  
 ⇒ SHG4A04GVDB**W**S-SA [-40 to +85°C product])



Please be sure to request delivery specifications that provide further details on the features and specifications of the products for proper and safe use. Please note that the contents may change without any prior notice due to reasons such as upgrading.