The M.2, which is employed in devices such as smartphones and tablet PCs, is a next-generation form factor (NGFF®) developed by the SATA-IO. It is more compact and thinner than the conventional mSATA drive and compatible with interfaces such as SATA, PCI Express, USB, SD, Display Port, I2C, and UART. It is now even employed in industrial equipment and embedded devices. TDK’s SNG4A series is comprised of SATA 3Gbps M.2s mounted with TDK SSD controller GBDriver® RS4. With an enhanced ECC function that can extend to 71bit/512byte as well as a read retry function and auto refresh function, they provide data reliability that far exceeds that of the existing M.2 specification. Also, data security is enforced as it is mounted with an encryption function AES128bit.

# NGFF: Next Generation Form Factor
High-Reliability M.2 (NGFF) SSDs Compatible with Serial ATA 3Gbps

TDK SSD controller IC GBDriver® RS4 Employed
Life Monitor Software Included, Enhanced ECC Function + Read Retry Function Equipped

M.2 (NGFF) Flash Drive

TDK’s SNG4A series is high-reliability M.2 (NGFF) SSDs up to a 64GB capacity at the size of 44mm x 20mm. They are available in both 2242-D2-B-M and 2242-D5-B-M types. The series employs TDK SSD controller GBDriver® RS4, which determines SSD performance.

The functions that increase reliability in read operations such as an enhanced ECC function, read retry function, and auto refresh function as well as the functions that increase reliability in write operations such as a data randomizer function, a write verify function for during power interruptions, and a global static wear levelling function allows optimal tuning in hardware and firmware designing.

Security has also been enhanced with a password lock function, AES128 encryption function, and a complete data erase function executed with the ATA Trim command. Furthermore, SSD Life Monitor Software makes maintenance such as replacing drives easy.

FEATURES

2. Serial ATA Standard Rev 2.6-compliant. (Gen1: 1.5Gbps / Gen2: 3.0Gbps) Read 215MB/s, Write 95MB/s achieved. (*1)
3. Equipped with TDK’s own static wear leveling algorithm. 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. (*2)
4. Equipped with a data randomizer function. Data patterns are automatically randomized during the write process, to minimize the risk of bit errors due to writing the same data repeatedly. As a result of this function, data reliability achieve greater in MLC.
5. Equipped with an auto refresh function. While there is no access by the host, internal data are automatically refreshed. This function is paused during access, so there is no delay in response.
6. Equipped with an enhanced ECC function. An error correction ability of 71bits/1KByte is equipped as standard.
7. Equipped with a read retry function. When an ECC error has occurred in a read operation, the GBDriver® RS4 changes the read potential and attempts to read the data again.
8. TDK GBDriver® RS4 algorithm and an internal 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.
9. SSD life monitor software “TDK SMART” is included.
10. By using our life monitor software (TDK SMART), it is possible to accurately assess the lifespan of actual equipment.
11. Supports security functions based on ATA standards. Customers can set and remove passwords to prevent falsification of leaking of personal and confidential information.
13. Support ATA Trim command (complete data erasing function).
14. 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.

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

EXAMPLES OF APPLICATIONS

- Thin-client computers, tablet computers, SATA RAID SSD installations, Data servers, Enterprise servers, embedded cloud systems and other IT equipment for cloud computing systems
- Digital tachographs, data logger, drive recorders, and rear-view monitors and other automotive equipment
- Multi-function printers (MFPs), commercial-use projectors, telephone conferencing systems, electronic blackboards and other office automation equipment
- Karaoke on demand systems, arcade games and other amusement equipment
- Semiconductor manufacturing equipment, NC machine tools, sequencers, programmable logic controllers, panel computers, embedded CPU boards and other factory automation equipment
- Automated ticket gates, automated ticket vending machines, commuter pass vending machines, train movement management systems, automated air ticket vending machines, automated check-in systems and other railway and transportation services equipment
- Cash registers and other point-of-sales (POS) equipment, convenience store and kiosk terminals, ATMs and other banking terminals
- Diagnostic imaging systems, blood analysis equipment, medical PCs, electronic patient records systems, DNA microarray systems, automatic biochemistry analyzers, remote medical care devices, automated care devices and other medical equipment and data analysis equipment
- Base station equipment for 4th generation (4G) mobile data communication systems such as LTE-Advanced/WMAx2, data broadcasting system supporting digital broadcasting and other communications and broadcasting equipment and information system devices
- Biometric authentication systems, entry/exit control systems, security terminals for surveillance cameras and other security equipment
- Earthquake emergency information systems, household fire detectors and other disaster prevention related equipment

* GBDriver® is a trademark or registered trademark of TDK Corporation.
• Complies with RoHs directive.
This means that, to 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**
  - SNG4A Series
  - M.2 Type 2242-D2-B-M (8GB to 32GB)
  - M.2 Type 2242-D5-B-M (64GB)
  - SLC NAND-type flash memory (8KB/Page)
  - TDK GBDriver® RS4
  - Serial ATA Revision 2.6
  - SATA Gen1: 1.5Gbps, Gen2: 3.0bps
  - 215MByte/sec
  - 95MByte/sec
  - 71bit/1KByte
  - 3.3V±5%
  - 0 to +70°C [‒40 to +85°C Industrial Option]
  - -25 to +85°C [‒40 to +85°C Industrial Option]
  - 0 to 90(%) RH [No condensation]

**CHARACTERISTICS**

- **Series**
  - SNG4A Series

- **Data capacity**
  - 8GB/16GB/32GB/64GB

- **Form factor**
  - M.2 Type 2242-D2-B-M (8GB to 32GB)
  - M.2 Type 2242-D5-B-M (64GB)

- **Memory type**
  - SLC NAND-type flash memory (8KB/Page)

- **Controller**
  - TDK GBDriver® RS4

- **Interface**
  - Serial ATA Revision 2.6

- **Transfer mode**
  - SATA Gen1: 1.5Gbps, Gen2: 3.0bps

- **Transfer speed**
  - Read(max.): 215MByte/sec
  - Write(max.): 95MByte/sec

- **Error check and correction (ECC)**
  - 7bit/1KByte

- **Power supply voltage**
  - 3.3V±5%

- **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/CC/VCSC

- **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)**

<table>
<thead>
<tr>
<th>Data Capacity</th>
<th>Part No.</th>
<th>Expected Endurance (Unit: billion times)</th>
<th>Allowable accesses per second according to age of equipment (When operating 24 hrs/365 days/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1 year</td>
<td>5 year</td>
</tr>
<tr>
<td>8GB</td>
<td>SNG4A08GXBB-SSA</td>
<td>788</td>
<td>24.99</td>
</tr>
<tr>
<td>16GB</td>
<td>SNG4A16GXDBC-SSA</td>
<td>1,576</td>
<td>49.97</td>
</tr>
<tr>
<td>64GB</td>
<td>SNG4A64GXDBC-SSA</td>
<td>6,304</td>
<td>199.99</td>
</tr>
</tbody>
</table>

* The above products have an operating temperature of 0 to +70°C. For products with an operating temperature of -0 to +85°C, convert the blue letter "C" in the product name to "W".

(Example: SNG4A08GXBB-SSA [0 to +70°C product] ⇒ SNG4A08GXBBWS-SSA [‒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.

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