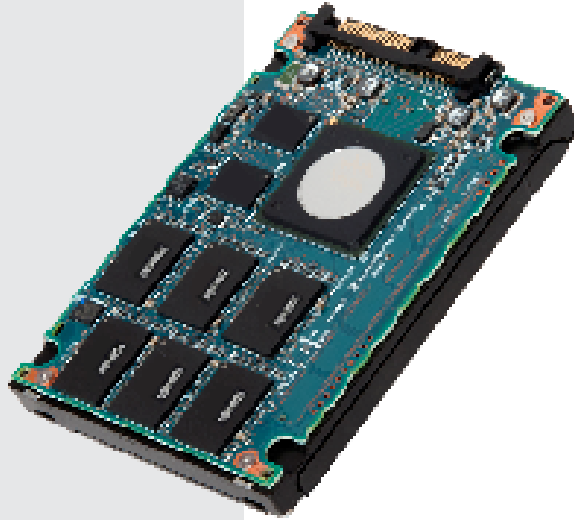


# SLC NAND

## 2.5-Inch SAS Solid State Drives

**TOSHIBA**  
Leading Innovation >>>

*Engineered to deliver performance,  
endurance, and reliability for business  
critical applications..*



MK1001GRZB  
MK2001GRZB  
MK4001GRZB

At the forefront of leading-edge manufacturing technology, Toshiba offers enterprise-class solid state drives (SSDs) designed to support the market's demand for higher performance, endurance, and lower power consumption in mission critical, enterprise applications.

The MKx001GRZB enterprise-class SSD represents the highest level of a tiered storage architecture that enables organizations to effectively tune the performance, capacity, and reliability of their storage environments. The MKx001GRZB is offered in capacities of 100GB, 200GB, and 400GB<sup>1</sup> and designed for compatibility and ease of integration into new or existing tier-0 enterprise storage systems, including servers, direct-attached storage, and network-attached storage.

The new 2.5-inch small form factor drives utilize the latest 32 nanometer (nm) enterprise grade single-level cell (SLC) NAND flash memory and 6Gb/s Serial Attached SCSI (SAS) interface. The Toshiba SSD delivers performance that outpaces competing enterprise-class SSDs, with random sustained 90,000 read and 16,000 write IOPS<sup>2</sup> and sequential sustained 500MB/s read and 250MB/s write throughput. Combined with a low power requirement of only 6.5 watts at operation, the Toshiba SSD also delivers an impressive power efficiency rating of 13,800 IOPS/watt.

- 32 nm Enterprise Grade Single-level Cell (SLC) NAND Flash Memory
- 6Gb/s Serial Attached SCSI (SAS) Interface
- Up to 400GB<sup>1</sup> of Storage Capacity
- Random Sustained 90,000 Read and 16,000 Write IOPS<sup>2</sup>
- Sequential Sustained 500MB/s<sup>3</sup> Read and 250MB/s<sup>3</sup> Write Throughput

Solid  
State Drive

### Series Overview

	MK1001GRZB	MK2001GRZB	MK4001GRZB
User Capacity	100GB <sup>1</sup>	200GB <sup>1</sup>	400GB <sup>1</sup>
Physical Capacity	128GB	256GB	512GB
Drive Interface	Serial Attached SCSI (SAS-2)		
Sector Size	512, 520, 528B		
NAND Technology	32nm SLC		
Transfer Rate to Host	6 Gb/s		

### Performance<sup>4</sup>

Sustained 4KB Random Read	90,000 IOPS
Sustained 4KB Random Write	16,000 IOPS
Sustained 64KB Sequential Read	500MB/s <sup>3</sup>
Sustained 64KB Sequential Write	250MB/s <sup>3</sup>
Sustained 4KB Random combined (70%/30% Read/Write, 100% Duty)	33,500 IOPS
Product Life	5 Years

### Reliability

Total Storage Capacity of			
Data Written <sup>2</sup>	8.2PB <sup>1</sup>	No Limit/Product Life	No Limit/Product Life
Availability (hrs/day x days/wk)		24 x 7	

### Power Requirements

Voltage	5V (+/- 5%), 12V (+/- 5%)
Power Consumption (Active)	6.5 watts (+12V / +5V)
Power Consumption (Efficiency)	up to 13,800 IOPS / watt

### Physical Size

Dimensions (W) x (D) x (H)	69.85 mm (2.75") x 100 mm (3.94") x 15.4 mm (0.59")
Weight	152 g (5.36 oz)

### Environmental

Temp - Operating	0° to 55°C (32° to 131°F)
Temp - Non-Operating	-40° to 70°C (-40° to 158°F)
Vibration - Operating	9.8 m/s <sup>2</sup>
Vibration - Non-Operating	49 m/s <sup>2</sup>
Shock - Operating	1,000G (0.5ms, ½ sine)
Shock - Non-Operating	1,000G (0.5ms, ½ sine)

### Limited Warranty

Limited Warranty	5 years (from date of purchase) <sup>5</sup>
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<sup>1</sup>One Gigabyte (1GB) means 10<sup>9</sup> = 1,000,000,000 bytes, one Terabyte (TB) means 10<sup>12</sup> = 1,000,000,000,000 bytes, and one Petabyte (1PB) means 10<sup>15</sup> = 1,000,000,000,000 bytes using powers of 10. A computer operating system, however, reports storage capacity using powers of 2 for the definition of 1GB = 2<sup>30</sup> = 1,073,741,824 bytes, 1TB = 2<sup>40</sup> = 1,099,511,627,776 bytes, and 1PB = 2<sup>50</sup> = 1,125,899,906,842,624 bytes, and therefore shows less storage capacity. Available storage capacity (including examples of various media files) will vary based on file size, formatting, settings, software and operating system, such as Microsoft Operating System and/or pre-installed software applications, or media content. Actual formatted capacity may vary.

<sup>2</sup>4KB random read/write I/O performance.

<sup>3</sup>MB/s = 1,024 x 1,024 Bytes/second.

<sup>4</sup>Testing conditions for these performance numbers stated in the table are as follows: Random Read: Queue depth=32, 4KB-aligned LBA; Random Write: Drive at steady state (preconditioned with 4KB random writes), Queue depth=32, 4KB-aligned LBA; Sequential Read: Queue

depth=32, 4KB-aligned LBA; Sequential Write: Drive at steady state (preconditioned with 64KB Sequential writes), Queue depth=32, 4KB-aligned LBA; Random combined: Drive at steady state (preconditioned with 4KB random writes), Queue depth=32, 4KB-aligned LBA; Please reference product manual for additional for additional information on test setup and configuration.

<sup>5</sup>Warranty for the 100GB capacity point is 5 years or 8.2PB total write capacity, whichever occurs first.

Subject to Change: While Toshiba has made every effort at the time of publication to ensure the accuracy of the information provided herein, product specifications, configurations, prices, system/component/options availability are all subject to change without notice. Product image may represent design model.

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