



Kanaga 2.5-Inch SATA Solid-State Drive

Industrial 2.5" SSD SATA-III (6Gb/s), 3D TLC

KGS250GDCI

Datasheet - Rev. 1.0



1. Description

SunChip's Kanaga 2.5" KGS250GD is high-performance SATA-III 6Gb/s embedded solid-state drive (SSD) technology designed for the unique capacity and workload requirements of a broad range of embedded systems, including telco and networking, industrial PC and automation, test and measurement, medical diagnostics and imaging, transportation, defense command and control, self-serve kiosk and POS, security and surveillance, and data recorders.

Features

Capacity

- 1920GB, 3840GB, 7680GB

NAND: 3D TLC

Sequential Performance⁽¹⁾

- 128kB Sequential Read: 556 MB/s (QD: 32)
- 128kB Sequential Write: 519 MB/s (QD: 32)

Random Performance⁽¹⁾

- 4kB IOPS Read: up to 95,500 (QD: 32)
- 4kB IOPS Write: up to 82,200 (QD: 32)

Power⁽¹⁾: 5V ±5%

- 128kB Sequential Read: 2.3 W
- 128kB Sequential Write: 3.2 W
- 4kB Random Read: 2.5 W
- 4kB Random Write: 3.6 W
- Idle: 1.4 W

Temperature Ranges

- Industrial: -40°C to 85°C
- Non-Operating: -40°C to 85°C

Reliability

- UBER: < 1 sector per 10¹⁶ bits
- MTBF: >2M hours

Endurance⁽¹⁾

- JESD219A: 13,100 TBW
- Sequential: 23,880 TBW

SMART Attribute Reporting

- Monitors device health
- Anticipates and predicts failures

Mechanical Dimensions

- 2.5-Inch Form Factor
- Length x Width x Height mm (inches) 100.5 (3.96) x 69.85 (2.75) x 7.0 (0.275)

Compliance

- SATA Revision 3.1 (SATA-III 6Gb/s)
- ATA/ATAPI-8 (ACS-3)
- FCC, CE, UL, RoHS, WEEE

Environmental (Non-operating)

- Humidity (non-condensing): 5% to 95%
- Shock: 1500G, half-sine wave, 0.5ms duration
- Vibration: 20G, 20 Hz to 2000 Hz

Data Security

- Integrated AES-256 encryption (data-at-rest)
- TCG/ Opal 2.0-compliant SED (Option)

(1) Based on the 7680GB device



Electrostatic Discharge (ESD) can damage this device. When handling the device, always wear a grounded wrist strap and use a static dissipative surface.



Any damage to the unit that occurs after its removal from the shipping package and ESD protective bag is the responsibility of the user.

2. Specifications

Capacity

Unformatted Capacity ⁽¹⁾ (GB)	User-Addressable LBA ⁽²⁾	User-Addressable Capacity Bytes
1920	3,750,748,848	1,920,383,410,176
3840	7,501,476,528	3,840,755,982,336
7680	15,002,931,888	7,681,501,126,656

(1) 1GB = 1,000,000,000 bytes. LBA: Logical Block Address; Logical Block Size = 512 Bytes/1 Sector.
(2) LBA: Logical Block Address; Logical Block Size = 512 Bytes/1 Sector.

Performance

Capacity (GB)	Performance Throughput ⁽¹⁾ 128kB File, Queue Depth (QD) = 32		IOPS ⁽¹⁾ 4kB File, Queue Depth (QD) = 32	
	Sequential Read MB/s	Sequential Write MB/s	100% Random Read	100% Random Write
1920	544	504	96,600	84,600
3840	557	523	95,400	82,300
7680	556	519	95,500	82,200

(1) Performance is based on fresh out-of-box condition formatted with NTFS filesystem and running CrystalDiskMark 8.0.0 with file size 1024MB. Actual results may vary depending on file system, workload, and SSD condition.

Power Consumption - 5V Supply

Capacity (GB)	Sequential Read ⁽¹⁾ 128kB, QD = 32	Sequential Write ⁽¹⁾ 128kB, QD = 32	Random Read ⁽¹⁾ 4kB, QD = 32	Random Write ⁽¹⁾ 4kB, QD = 32	Idle	Unit
1920	2.1	3.0	2.2	3.8	1.3	W
3840	2.3	3.3	2.4	3.9	1.4	W
7680	2.3	3.2	2.5	3.6	1.4	W

(1) Power consumption tests were done using Keysight test system at 25°C

Temperature and Humidity

Part Number	Operating Temperature	Non-Operating ⁽¹⁾ Temperature	Humidity (Non-Condensing)
KGS250GDCIxxx-0011	-40°C to 85°C	-40°C to 85°C	5% to 95%

(1) Maximum non-operating temperature assumes data is stored on the SSD. Temperatures above 85°C are beyond NAND specification for data retention. Please see *Temperature Considerations for Industrial Embedded SSDs* whitepaper under the industrial SSD section of SunChip website (SunChip.com)

Note: For detailed part numbers, please contact your sales representative for more information.

Shock and Vibration

Reliability	Test Conditions	Reference Standards
Shock	1500G, half-sine wave, 0.5ms duration	JESD22-B110B.01
Vibration	20G, 20 Hz to 2000 Hz	JESD22-B103B.01

3. Reliability

Endurance

Capacity (GB)	JESD218A ⁽¹⁾ & JESD219 Enterprise Workloads		100% Sequential Workloads	
	Total Bytes Written TBW (TB)	Drive Writes per day (3 years)	Total Bytes Written TBW (TB)	Drive Writes per day (3 years)
1920	3,200	1.52	5,970	2.84
3840	6,500	1.54	11,940	2.84
7680	13,100	1.55	23,880	2.84

(1) JESD218A assumes an active temperature at 55°C and a retention temperature at 40°C

Mean Time Between Failures (MTBF)

The SSD achieves a MTBF of greater than 2M hours predicted and is derived from the component reliability data using Telcordia SR-332 methods at 40°C and tested under standard environmental operating conditions.