



6Gb/s SAS Enterprise 2.5" SSDs

Optimus MAX™ 4TB SAS SSD

Achieve ultimate capacity and scalability for maximum TCO savings

Features

- Guardian Technology™ Platform for enhanced endurance
- MTBF 2.5 Million Hours***
- UBER - <1 sector in 10¹⁸ bits read
- Up to 0.5 full DWPD****
- Limited 5 Year Warranty****

Read-Intensive Application Workloads

- Data Warehousing
- Media Streaming
- Web Servers
- Video on Demand (VOD)
- Web-based Applications

The Optimus MAX™ 4TB SAS SSD from SanDisk® is the first SSD of its kind to deliver SAS performance and features at the cost of SATA SSD-like prices for enterprise, cloud and virtualized data centers. This 4TB* SSD enables organization to transition to a leaner infrastructure model, for maximum total cost of ownership (TCO) savings and surpasses the current high capacity 2.5" SAS SSDs and 2.5" SAS HDDs on the market today. The Optimus MAX SSD is optimized for read-intensive application workloads such as, Data Warehousing, Media Streaming, Web Servers, Video on Demand (VOD), and Web-based Applications with a typical workload comprised of a 90/10 read/write mix. This 4TB SAS SSD alleviates I/O bottlenecks by providing high-density storage for efficient data throughput to deliver, high performance, superior reliability and enhanced endurance for maximum application scalability.

The Optimus MAX 4TB* SAS SSD features industry leading 19nm eMLC with a native 6Gb/s SAS interface and provides data transfer rates of up to 500/500MB/s** sequential read/ write and performance of up to 85K/11K IOPS random read/ write. This SSD offers 0.5 full drive writes per day (DWPD) with a limited 5 year warranty****. The Optimus MAX 4TB SAS SSD removes the flash capacity barrier for replacing 10K and 15K RPM SAS HDDs and provides an ideal solution for true storage stack applications.

Guardian Technology™ Platform

The Optimus MAX 4TB SSD is powered by SanDisk's innovative Guardian Technology Platform, a comprehensive suite of enterprise features comprised of FlashGuard™, DataGuard™ and EverGuard™ technologies.

FlashGuard Technology combines Aggregated Flash Management, which treats all flash elements as a single system, and Advanced Signal Processing, which dynamically adjusts flash parameters throughout the life of the SSD, to reliably extract significantly more life from commercial-grade MLC flash, making it suitable for read-intensive application workloads.

DataGuard Technology features full data path protection, safeguarding user data from corruption along all data paths in the SSD. DataGuard also protects the SSD against loss of data at the page and block levels using a unique feature called F.R.A.M.E. (Flexible Redundant Array of Memory Elements). F.R.A.M.E. acts as a data recovery feature that enables the recovery of user data even after catastrophic events such as flash page or block failures.

EverGuard Technology protects against loss of user data in the event of unexpected power interruptions using a 3rd generation backup power circuit design and high reliability discrete capacitors.

Optimus MAX™ 2.5" SAS SSD

Performance**

Interface	SAS 6Gb/s
Interface Ports	Dual
Sequential Read/Write**	Up to 500/500 MB/s ¹ per port
Random Read/Write (IOPS)	Up to 85K/11K ²

Capacity

19nm eMLC*	4TB
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Reliability

Sector Sizes	512, 520 byte
Data Reliability (UBER)	< 1 unrecoverable error in 10 ¹⁸ bits read ^{*****}
MTBF***	2.5 Million Hours
Data Fail Recovery	F.R.A.M.E. (Flexible Redundant Array of Memory Elements)
Power Fail Recovery	EverGuard™ Technology: Backup Power Circuitry
Data Path Protection	DataGuard™ Technology
Warranty****	The lesser of 5 years or maximum endurance used

Endurance

DWPD (Random Workload)****	0.5 DWPD
TBW (Terabytes Written)	3,468 TBW

Power

Vcc	5V, - 5%/+10%
Active (Typ)	7W

Environmental

Shock	1000 g half-sine, 0.5 msec, 3 shocks along each axis, X, Y, Z, in each direction
Vibration	2.17 g rms, 7-800 Hz
Operating Temperature	0° C to 70° C (internal)
Storage Temperature	-40° C to 90° C
Humidity	5% to 95%, non-condensing, relative humidity
Altitude	5486.4 m [18,000 ft]

Mechanical

Length	100.20 mm
Width	69.85 mm
Height	15 mm

(1) Based on a 128KB transfer rate, using Oakgate SVF exerciser
(2) Based on 4KB transfer rate using Oakgate SVG exerciser

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At SanDisk, we're expanding the possibilities of data storage. For more than 25 years, SanDisk's ideas have helped transform the industry, delivering next generation storage solutions for consumers and businesses around the globe.

Optimus MAX™ 2.5" SAS SSD - Ordering Information

Part Number	Capacity
SDLLOC DR-038T-5Cxx	4TB

xx - Pack Out Option:

Generic/Sample: A1
10 Pack: 02
Bulk Pack: 03

Specifications subject to change without notice.

*1 GB = 1,000,000,000 bytes. Actual user capacity less.

**Up to stated speed. Based on internal testing; performance may vary depending upon drive capacity, host device, OS and application. 1 megabyte (MB) = 1 million bytes.

***MTBF - Mean Time Between Failures based on parts stress analysis.

****Warranty/DWPD - The lesser of 5 years from the date of manufacture of the product or the date on which the product's relevant endurance thresholds set forth in the product specifications are reached.

*****1 recoverable error in 10¹⁸

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