



6Gb/s SATA Enterprise 2.5" SSDs

## CloudSpeed™ Product Family of SATA SSDs

Cost-effective storage for a variety of read-intensive, mixed-use and write-intensive workloads.

### CloudSpeed Eco™ and CloudSpeed Ascend™/Read-Intensive Application Workloads

- Web Servers
- Web 2.0 Content Repository
- Photo Sharing
- Media Streaming
- Video on Demand (VOD)
- Cloud Computing  
Virtual Tape Libraries (VTL)
- Web-based Applications
- File Servers

### CloudSpeed Ultra™/Mixed-Use Application Workloads

- On-Line Transaction Processing (OLTP)  
Databases
- Financial Transactions
- E-Commerce
- SQL Logging
- Collaboration
- E-Mail/Messaging

### CloudSpeed Extreme™/Write-Intensive Application Workloads

- High Performance Computing (HPC)
- Oil and Gas
- Life Sciences
- Aerospace
- Engineering
- Media Editing
- Analytics
- Database Logging
- Data Warehousing

The next generation of 19nm CloudSpeed SATA SSDs are designed with a range of endurance and optimized for read-intensive, mixed-use and write-intensive application workloads in enterprise and cloud computing environments. Leveraging SanDisk's proprietary Guardian Technology™ Platform, tier-one OEM-enterprise firmware, proven power fail technology and the latest generation of consumer 19nm MLC NAND flash, CloudSpeed SSDs offer all the features expected from an enterprise-class drive at the right value.

Available in capacities of 100GB-960GB\*, the CloudSpeed SSD product family features a 6Gb/s SATA interface and provides data transfer rates up to 450/400 MB/s\*\* sequential read/write and performance up to 80K/25K IOPS random read/write. CloudSpeed SSDs offer high data integrity by employing a combination of powerful error correction and detection, full data path protection, thermal monitoring, and data fail recovery. These enterprise features enable CloudSpeed SSDs to deliver up to 5x higher endurance than competing client MLC SSDs.

### Guardian Technology™ Platform

The product family of CloudSpeed SATA SSDs is powered by SanDisk's proprietary Guardian Technology Platform, a suite of enterprise features that include 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 cost-effective MLC flash, making it suitable for read-intensive, mixed-use and write-intensive application workloads.

DataGuard Technology features full data path protection, safeguarding user data from corruption along all data paths in the SSD.

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.

**SanDisk®**

**CloudSpeed™ Product Family of 2.5" SATA SSDs**  
**Preliminary Specifications subject to change**

	CloudSpeed Eco	CloudSpeed Ascend	CloudSpeed Ultra	CloudSpeed Extreme
<b>Performance</b>				
Interface	6Gb/s SATA			
Sequential Read/Write (MB/s)**	Up to 450/400 MB/s <sup>1</sup>			
Random Read/Write (IOPS)	Up to 80K/15K <sup>2</sup>	Up to 80K/15K <sup>2</sup>	Up to 80K/25K <sup>2</sup>	Up to 75K/25K <sup>2</sup>
Access Time	< 2.0 ms			
<b>Capacity</b>				
19nm MLC User Capacities*	240GB, 480GB, 960GB	240GB, 480GB, 960GB	200GB, 400GB, 800GB	100GB, 200GB, 400GB, 800GB
<b>Reliability</b>				
Data Reliability (BER)	1 unrecoverable error in 10 <sup>17</sup> bits read <sup>3</sup>			
MTBF***	2M hours		2.5M hours	
Data Fail Recovery	Recover up to 1 NAND flash erase block of data			
Power Fail Recovery	High-reliability backup-power circuitry			
Temperature Monitoring	Performance throttling upon warning/critical temperature			
Warranty	The lesser of 3 years or maximum endurance used****		The lesser of 5 years or maximum endurance used****	
<b>Endurance</b>				
DWPD (Random Workload)	1 DWPD <sup>5</sup> /****	1 DWPD****	3 DWPD****	10 DWPD****
<b>Power</b>				
Vcc	5V ± 5%			
Active (Typ)	5.2W			
Idle	2.2W			
<b>Environmental</b>				
Shock (operating)	1000g @ 1.0 msec, 1 shock along each axis, X, Y, Z, in each direction			
Vibration (operating)	2.17 g rms 7-800 Hz			
Operating Temperature	0° C to 70° C (internal)			
Storage Temperature	-40° C to 95° C			
Humidity	5% to 95%, non-condensing, relative humidity <sup>4</sup>			
Altitude	-200 feet to 10,000 feet			
<b>Mechanical</b>				
Length	100.2 mm			
Width	69.85 mm			
Height	7 mm			

(1) Based on a 128KB transfer rate, using Oakgate SVF exerciser  
(2) Based on 4KB transfer rate using Oakgate SVG exerciser  
(3) The JEDEC 64.8 specification requires 1 in 10<sup>17</sup> for enterprise-class SSDs  
(4) Based on MIL-STD 883C Method 507.4  
(5) Endurance @ JeDEC 219 Workload

CloudSpeed Eco - Ordering Information	CloudSpeed Ascend - Ordering Information
<b>Capacity &amp; Part Number</b>	
(240GB) - SDFNDAR-240G-1Hxx	(240GB) - SDFODAR-240G-1Hxx
(480GB) - SDFNDAR-480G-1Hxx	(480GB) - SDFODAR-480G-1Hxx
(960GB) - SDFNCAR-960G-1Hxx	(960GB) - SDFOCAR-960G-1Hxx
CloudSpeed Ultra - Ordering Information	CloudSpeed Extreme - Ordering Information
(200GB) - SDFODAM-200G-1Hxx	(100GB) - SDFOEAW-100G-1Hxx
(400GB) - SDFODAM-400G-1Hxx	(200GB) - SDFODAW-200G-1Hxx
(800GB) - SDFOCAM-800G-1Hxx	(400GB) - SDFODAW-400G-1Hxx
--	(800GB) - SDFOCAW-800G-1Hxx

**xx - Pack Out Option:**  
Generic/Sample: A1    10 Pack: O2    Bulk Pack: O3

Specifications subject to change without notice.  
\*1GB = 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 3 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.  
\*\*\*\*\*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.  
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