Data Sheet

FlashMAX® II PCIe

Enterprise Solid-State Drives

Highlights

- Uncompromised, consistent performance across a wide variety of workloads
- Sustained, predictable performance over the lifetime of the product
- Highest capacity in the industry for a PCIe flash storage product – up to 4.8TB in a HH-HL form factor
- UEFI boot, available with Standard models
- Dynamic, global wear-leveling
- Enterprise-grade reliability: Flash-aware RAID, End-to-End data-path protection, advanced ECC, secure erase, power fail protection

Applications/Environments

- Enterprise-class servers and high performance computing
- Suitable for the most demanding scale-out database workloads
- Online Transaction Processing (OLTP) and Online Analytical Processing (OLAP)
- High Frequency Trading (HFT)
- Virtual Computing
- Space and/or power constrained environments

4800GB, 2200GB, 1100GB and 550GB
MLC | HH-HL SFF | PCIe 2.0

HGST Storage Class Memory

HGST incorporates specialized software and hardware that combine to implement Storage Class Memory (SCM) within the server. The HGST architecture has been designed to tightly integrate different kinds of flash media, hardware and software to deliver memory-class performance with storage-class capacity and persistence. HGST's FlashMAX® II SCM devices and associated software deliver performance without compromise, along with HDD-like capacity in a very compact, universal form factor.

vFAS™

vFAS is an Adaptive Scheduling algorithm, which delivers the most efficient access to flash media for applications. In addition to providing optimized access for peak performance, vFAS also includes sophisticated techniques to ensure applications get steady sustained performance at all times. vFAS virtualizes the underlying flash media to present a standard block device interface to applications, without inefficient storage protocols or interconnects, resulting in significant gains in application performance.

FlashMAX II presents a traditional block storage volume to the host so that applications can easily access it without modification. vFAS has been designed to treat flash media more like an extension of memory, while maintaining a traditional block storage interface for applications. All of this is done without the use of storage protocols, storage controllers or storage interconnects. The result is latencies under 21 µs, which is closer to DRAM performance.

Unconditional Performance

FlashMAX II with vFAS delivers consistent performance across all application workloads, even when the device is fully utilized. FlashMAX II with vFAS delivers application performance whether it is peak small block read performance, where a single low profile card can deliver over 1.1 million IOPS, or sustained mixed read/write performance when the drive is full.

Simplified Management

Unlike many competing solutions, 100% of the capacity available on a FlashMAX II card is available as a single host volume on the server without having to leverage 3rd party software RAID products to stripe across multiple drives. With FlashMAX II you can have a single volume presented to the operating system up to the advertised formatted capacity, which can be as large as 4.8TB when using the FlashMAX II Capacity model.

Features and Benefits

	Feature / Function	Benefits
Performance	2700MB/s / 1000MB/s sequential R/W	Maximum performance density in a HH-HL PCIe SSD drives maximum consolidation and savings
	343K / 243K IOPS random R/W	
	314K IOPS on 70/30 mix R/W	
Low Latency	< 21 µs write latencies	DRAM-like performance
Capacity	4800GB, 2200GB, 1100GB, 550GB	Industry leadership in capacity in HH-HL form factor
Reliability	Power fail protection	Assures data integrity during power failures

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HGST Quality and Service

HGST's FlashMAX II family extends the company's long-standing tradition of performance and reliability leadership. A balanced combination of new and proven technologies enables high reliability and availability to customer data.

HGST drives are backed by an array of technical support and services, which may include customer and integration assistance. HGST is dedicated to providing a complete portfolio of SSD/HDD solutions to satisfy today's monumental computing needs.

Highest Capacity in Low Profile

The FlashMAX II Capacity model delivers 4.8TB of flash in a single low profile form factor PCIe device. FlashMAX II Capacity enables new levels of consolidation in the data center, making it ideal for web scale, enterprise and service provider environments requiring the maximum usable flash capacity.

Flash-aware RAID

vFAS supports flash-aware RAID for enhanced reliability and data availability. This feature allows the discrete flash components included on the card to be isolated as separate slices to provide 7+1 RAID protection, implemented in a flash optimized manner. The flash modules on a card are spread across RAID groups, allowing for multiple failures to occur without disrupting an application's access to the data. This delivers continuity of operations in the event there are failures with the flash media itself.

Information and Technical Support

www.hgst.com (main website)
www.hgst.com/partners (partner website)

North America

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Toll Free: +1 888 426-5214, Direct: +1 408 717-8087

Asia Pacific

support_ap@hgst.com / +65 6840 9595

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Program Support

Partners First Program: channelpartners@hgst.com

Specifications

Model # / Part #	VIR-HW-M2-LP-550-1B / 0T00809 VIR-HW-M2-LP-1100-1B / 0T00817 VIR-HW-M2-LP-1100-2B / 0T00812 VIR-HW-M2-LP-2200-2B / 0T00803 VIR-HW-M2-LP-4800-2B / 0T00819		
Configuration			
Interface	PCIe 2.0 (x8)		
Form factor	Half-Height, Half-Length (HH-HL) add-in card		
Performance[1]	STANDARD MODELS	PERFORMANCE MODELS	CAPACITY MODEL
Capacities (GB[2])	550, 1100	1100, 2200	4800
Read throughput (max MB/s, sequential 64K)	1,600	2,700	2,600
Write throughput (max MB/s, sequential 64K)	550	1,000	900
Read IOPS (max IOPS, random 4K)	174,000	343,000	269,000
Write IOPS (max IOPS, random 4K)	27,000	57,000	51,000
Peak write IOPS (max IOPS, random 4k)	109,000	243,000	213,000
Mixed IOPS (70/30 R/W, random 4k)	72,000	154,000	128,000
Peak mixed IOPS (70/30 R/W, random 4k)	161,000	314,000	264,000
Read IOPS (max IOPS, random 8k)	125,000	247,000	214,000
Write IOPS (max IOPS, random 8k)	13,000	28,000	27,000
Latency 512B (µs)	21	20	19
Endurance			
Random	3 DW/D	3 DW/D	1.3 DW/D
Warranty			
Warranty	3 years	3 years	5 years
Physical			
Dimensions, without bracket (mm)	167.54 x 68.91 x 18.39		
Weight (g)	141.75	198.45	198.45
Environmental			
Power consumption (max)	25 Watts		
Operating temperature	0° to 45°C		
Non-operating temperature	-40° to 70°C		
JEDEC compliance	3-month retention at 40°C at EOL		
Operating Systems			
Linux	RHEL 5/6, SLES 10/11, CentOS 5/6, Oracle EL 5/6, Debian 4/5/6, Ubuntu 8/9/10/11/12, Fedora Core 12-18, Open SUSE 11, 12		
Windows	64-Bit Microsoft Server 2008 R2 SP1, Windows 2K-8 R2, Hyper-V core server, Windows 2012 Server, Windows 2012 Hyper-V core server		
VMware	ESXi 5.X		
Software			
HGST Device Manager (HDM)	CLI and GUI interface		

[1] All performance measurements are in full sustained mode except where noted as "Peak."

[2] One gigabyte (GB) is equal to one billion bytes, one terabyte (TB) is equal to 1,000GB (one trillion bytes), and one petabyte (PB) is equal to 1,000TB (one quadrillion bytes) when referring to solid-state drive or hard drive capacity. Accessible capacity will vary from the stated capacity due to formatting and partitioning of the drive, the computer's operating system, and other factors.

Agency Certifications

RoHS (DIRECTIVE 2011/65/EU) REACH SVHC
USA/Canada | UL 60950 1 & CSA C22.2, FCC Part 15 Subpart B; Section 15.109A/ANSI C63.4 (2003); ICES-003 Version 4, Class A; Radiated & Conducted Emissions Class A; EN 55022, Class A; EN 55024 Immunity
Europe | 2004/108/EC EMC Directive; CE IEC 61000 Class A Mark
Japan | VCCI - V-1/2009.04

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