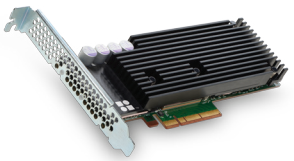
FlashMAX® PCIe

Highlights

- Uncompromised 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 support
- Enterprise-grade reliability: Flash-aware RAID, End-to-End data-path protection, advanced ECC, secure erase, power fail protection

Applications/Environments

- Cloud, hyperscale, enterprise 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)
- Virtualized computing
- Space and/or power constrained environments



FlashMAX II Capacity | 4800GB
FlashMAX III | 2200GB and 1100GB
MLC | HH-HL | PCIe 2.0

HGST FlashMAX® PCIe Accelerators

FlashMAX PCIe SSDs offer unprecedented application-performance in a half-height, half-length form factor, allowing today's most demanding cloud, hyperscale and enterprise applications to scale to new heights. 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 density and persistence. HGST's FlashMAX devices and associated software deliver performance without compromise, along with HDD-like capacity in a 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.

Unconditional Performance

FlashMAX PCIe SSDs with vFAS deliver consistent performance across all application workloads, even when the device is fully utilized. FlashMAX with vFAS delivers application performance whether it is peak small block read performance, 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 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, you can have a single volume presented to the operating system up to the formatted advertised capacity.

FlashMAX PCIe SSDs present 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 access latencies under 25 µs, which is closer to DRAM performance than storage.

HGST Quality and Service

HGST's FlashMAX PCIe SSD 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.

Global and Local Wear Leveling

FlashMAX with vFAS offers global wear leveling to maximize the lifetime of the Flash media. Also, data is relocated to other parts of Flash that are less-used whenever needed. The sophisticated wear leveling delivers maximum lifetime of the Flash media.

Features & Benefits

	Performance	Low Latency	Capacity	Reliability
Feature/function	• 150k 70/30 mixed R/W IOPS • 2700MB/s / 1400MB/s sequential R/W IOPS • 531k random read IOPS	< 30 µs write latencies	• 4800GB • 2200GB • 1100GB	• 0.44% AFR (2M hours MTBF) • Power-safe write processing • End-to-end data-path protection • Advanced ECC and global wear-leveling
Benefit	Maximum performance density in a HH-HL PCIe SSD drives maximum consolidation and savings.	DRAM-like performance.	High capacity, all presented as a single volume.	Higher reliability increases return on investment.

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Specifications

Model/Part No.	VIR-M3-LP-1100-1A / 0T00795 VIR-M3-LP-2200-1A / 0T00797 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]	**FLASHMAX III**	**FLASHMAX II CAPACITY**
Capacities (GB[2])	1100/ 2200	4800
Read throughput (max MB/s, sequential 128k)	2,700	2,600
Write throughput (max MB/s, sequential 128k)	1,400	900
Read IOPS (max IOPS, random 4k)	531,000	269,000
Write IOPS (max IOPS, random 4k)	59,000	51,000
Peak write IOPS (max IOPS, random 4k)	308,000	213,000
Mixed IOPS (70/30 R/W, random 4k)	150,000	128,000
Peak mixed IOPS (70/30 R/W, random 4k)	335,000	264,000
Read IOPS (max IOPS, random 8k)	281,000	214,000
Write IOPS (max IOPS, random 8k)	30,000	27,000
Latency 512B (µs)	22	19
Reliability		
MTBF[3] (M hours)	2.0	2.0
Annual failure rate[3] (AFR)	0.44%	0.44%
Endurance	2 DW/D	1.3 DW/D
Warranty	5 years	5 years

Physical		
Dimensions, without bracket (mm)	167.54 x 68.91 x 18.39	167.54 x 68.91 x 18.39
Weight, without bracket (g)	200	260
Environmental		
Power consumption (max)	25 Watts	25 Watts
Operating temperature	0° to 45°C	0° to 45°C
Non-operating temperature	-40° to 70°C	-40° to 70°C
JEDEC compliance	3-month retention at 40°C at EOL	3-month retention at 40°C at EOL
Operating Systems		
Linux	RHEL 5-7, SLES 10/11, CentOS 5-7, Oracle EL 5/6, Debian 4-6, Ubuntu 8-14, 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.

[3] MTBF and AFR targets are based on a sample population and are estimated by statistical measurements and acceleration algorithms under median operating conditions. MTBF and AFR ratings do not predict an individual drive's reliability and do not constitute a warranty.

Information & Technical Support

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Partners First Program

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