SMART®
Modular Technologies

M.2 SATA

SMART Modular Technologies' industrial grade M.2 SATA module solid state drive products specifically supports OEM markets, such as server, storage, networking, and data communications. The M.2 SATA products are designed to serve applications that require reliable internal storage, yet demand a small footprint. The M.2 modules can be used for storing and executing boot up code, operating systems, and also for data tables and general purpose storage.

Utilizing an industry standard M.2 SATA interface and connector, the M.2 SATA XL+ product in 2242-D3-B-M form factor provides SATA III interface performance for industrial embedded applications with lower drive capacity needs. The SMART M.2 SATA XP+ product in 2260-D2-B-M form factor offers high level sequential and random read/write performance in transaction intensive applications. They can also easily integrate into a host system without any special BIOS modifications or additional device drivers. The X10 is SMART's latest product, and has enterprise class features, including End-to-End protection and over provisioning to increase endurance.

SMART offers both single-level cell (SLC) and multi-level cell (MLC) M.2 SATA modules. SMART's industrial grade products address enhanced reliability by incorporating onboard error detection and correction as well as static and dynamic wear leveling algorithms, providing reliable operation over the product life cycle.
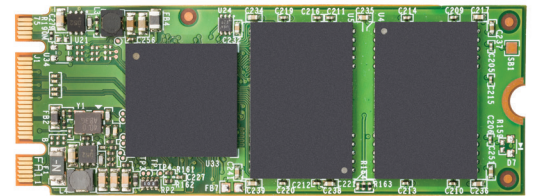
SMART's M.2 SATA products support self monitoring analysis and reporting technology (S.M.A.R.T.), which is designed to reduce field failures and unscheduled service maintenance. By providing an accurate forecast of the expected lifespan, S.M.A.R.T. enables reliable monitoring applications that efficiently guarantee 24/7 service availability.

Features & Benefits

- Whole drive static and dynamic wear leveling
- Advanced error detection/correction circuitry for superior data reliability
- Support for 48-bit LBA addressing for larger transfer sizes
- ATA and SATA Interface Power Management support
- Native Command Queuing (NCQ) support with a maximum queue depth of 32

Product Family Overview

	Capacity	Performance Sequential
M.2 SATA XL+		
2242-D3-B-M SLC	8GB to 64GB	510MB/s Read (max) 140MB/s Write (max)
M.2 SATA XP+		
2260-D2-B-M SLC	16GB to 128GB	510MB/s Read (max) 380MB/s Write (max)
M.2 SATA X10		
2260-DR-B-M MLC	60GB to 240GB	520MB/s Read (max) 350MB/s Write (max)
2280-D2-B-M MLC	60GB to 480GB	510MB/s Read (max) 380MB/s Write (max)

Applications

- NAS / SAN storage systems
- x86 server-storage appliances
- Distributed scale-out cloud servers
- Telecom and networking routers and switches
- ATCA compute blades
- Industrial control
- Single board computers for defense, gaming and industrial control applications
- Printers

M.2 SATA

Specifications

	M.2 XL+	M.2 XP+	M.2 X10
Performance			
	SLC	SLC	MLC
Host Interface Rate (Maximum)	6.0 Gbps		
Number of Flash Channels	4	8	4
Capacities	8GB to 64GB	16GB to 128GB	60GB to 480GB
Sequential Read (maximum)	510MB/s	510MB/s	530MB/s
Sequential Write (maximum)	140MB/s	380MB/s	380MB/s
Random Read (maximum)	46K	>40K	>80K
Random Write (maximum)	27K	60K	>88K
Host Interface Rate (maximum)	6.0Gb/s, 3.0Gb/s or 1.5Gb/s (depends on host connection)		
Reliability			
Data Reliability	< 1 Non-Recoverable Error in 10^{15} bits read		
Data Retention	10 years >90% life remaining 1 year at the end of life		
Endurance	85TB per GB in capacity		2.5TB per GB in capacity
Error Correction / Error Detection (BCH)	Up to 43 bits per KByte for MLC Up to 68 bits per Kbyte for SLC		Up to 75 bits per KByte for MLC
Environmental			
Shock – Non-Operating	1500 g half-sine, 0.5 msec, 1 shock along each axis, X,Y,Z in each direction		
Shock – Operating	50 g half sine, 11 msec, 3 shocks along each axis, X,Y,Z in each direction		
Vibration – Operating	16.4 g rms 10-2000Hz, 3 axis for XL+ and XP+ 20 g rms 80-2000Hz, 1.52mm 20-80Hz, 3 axis for M.2 X10		
Operating Temperature	C-temp: 0°C to 70°C (MLC and SLC) I-temp: -40°C to +85°C (SLC only)		
Storage Temperature	-40°C to +85°C (MLC) -40°C to +85°C (SLC)		
Humidity	10% to 90%, non-condensing, relative humidity		
Physical			
Length	42.0 mm	60.0 mm	80.0 mm
Width	22.0 mm		
Height	3.50 mm		

M.2 SATA XL+ Ordering Information

Part Number	Capacity
SLC Commercial Grade	
SH9M2S46D008GJS01	8GB
SH9M2S46D016GJS01	16GB
SH9M2S46D032GJS01	32GB
SH9M2S46D064GJS01	64GB
SLC Industrial Grade	
SH9M2S46D008GJSI01	8GB
SH9M2S46D016GJSI01	16GB
SH9M2S46D032GJSI01	32GB
SH9M2S46D064GJSI01	64GB

M.2 SATA XP+ Ordering Information

Part Number	Capacity
SLC Commercial Grade	
SH9M2S66D016GHS02	16GB
SH9M2S66D032GHS02	32GB
SH9M2S66D064GHS02	64GB
SH9M2S66D128GHS02	128GB

M.2 SATA X10 Ordering Information

Part Number	Capacity
2260-DR-B-M MLC Commercial Grade	
SV9M2S66D060GLM21	60GB
SV9M2S66D120GLM21	120GB
SV9M2S66D240GLM21	240GB
2280-D2-B-M MLC Commercial Grade	
SV9M2S86D060GLM21	60GB
SV9M2S86D120GLM21	120GB
SV9M2S86D240GLM21	240GB
SV9M2S86D480GLM21	480GB

Contact information

Corporate Headquarters/North America: T: (+1) 800-956-7627 • T: (+1) 510-623-1231 • F: (+1) 510-623-1434 • E: info@smartm.com

Customer Service: T: (+1) 978-303-8500 • E: customers@smartm.com

Latin America: T: (+55) 11 4417-7200 • E: sales.br@smartm.com

EMEA: T: (+44) 7825-084427 • E: sales.euro@smartm.com

Asia/Pacific: T: (+65) 6678-7670 • E: sales.asia@smartm.com

For more information, please visit: **www.smartm.com**

SMART®
Modular Technologies