



SSD Overview

Enterprise Grade Solid State Drive Solutions

Zeus^{IOPS} | MACH8 Family | MACH4 | UM-SSD

ZEUS^{IOPS} SOLID STATE DRIVE

Zeus^{IOPS} is a unique solid state drive designed to create a storage performance revolution for enterprise applications. Zeus^{IOPS} enables storage systems to realize outstanding, sustainable Input/Outputs per second (IOPS) to relieve performance bottlenecks associated with traditional rotating media disk drives.

Zeus^{IOPS} breathes new life into existing storage infrastructures, increases server utilization, and reduces the total cost of ownership. Zeus^{IOPS} eliminates the wait time for processors associated with rotating media access latency. One Zeus^{IOPS} drive can replace multiple hard drives, eliminate the need for additional volatile DRAM, and ease the cliff-like performance drop-off in performance from DRAM to rotating media in storage systems.

Zeus^{IOPS} Solid State Drive is revolutionizing the way businesses access critical data by overcoming the performance bottleneck inherent to traditional rotating media HDD storage.

Features

- Built-in wear leveling
- Random transactional performance in excess of 46,000 IOPS sustained
- Over 200 times faster at transactional performance than a 15K RPM enterprise class disk drive
- Sustained random or sequential large block transfers to 220 MB/s
- Less than half the power consumption of 15K HDD's
- 3.5" form factor for drop-in replacement into existing storage systems

Product Specifications

Product Type

Zeus^{IOPS} SSD

Capacity (Unformatted)

Up to 512 GB

Interface

	FC	SAS	SATA
Performance	4Gb/sec	3Gb/sec	3Gb/sec
Availability	Dual-port	Dual-port	Single-port

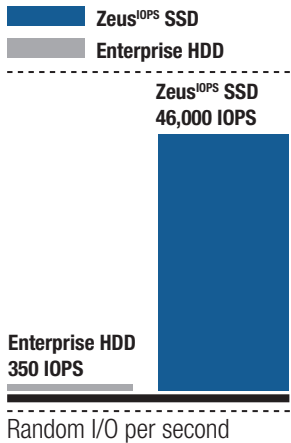
Performance

Average Access Time	20-120 microseconds
Sustained Read Throughput	220 Mbytes/sec
Sustained Write Throughput	115 Mbytes/sec
Random IOPS Read Operations	46,000 IO/sec, sustained
Random IOPS Write Operations	16,000 IO/sec, sustained

Physical:

Form Factor	3.5-inch
Operating Temperature	-20°C to +70°C
Dimensions (mm)	147mm (L) x 101.6mm (W) x 20.0mm (H)
Weight	<0.4 kg

Transactional Performance



PRODUCT KEY

Part #: Z(##)I(IR)FF-(xxx)UT-XXX

Z## = Zeus Family (## = Number of Channels)

I = Interface

F: FC

Z: SAS

S: SATA

IR = Interface Revision

A: 1.0Gb

B: 2.0Gb

C: 3.0Gb

D: 4.0Gb

F: TBD

FF = Form Factor

3B: 3.5 in. (20mm Z-Height)

xxx = Capacity

T = Temperature C: Commercial (0° to 70°C)

U = RoHS Compliant

XXX = Customer Specific (Internal Use only)

MACH4 SOLID STATE DRIVE

MACH4's unique blend of performance, size, and low power makes it an ideal solution for blade servers, industrial PCs, and small format devices requiring the highest throughput in the smallest package. As more technology is packed into tighter designs, the need for smaller solid state storage formats will increase. Many of these applications including GPS/navigation solutions, automotive entertainment systems, interactive kiosks, and even ultra-compact thin clients require the smallest possible storage solutions that, until now, lacked the performance required to make them true hard disk replacements. MACH4 solves this dilemma with a high performance, multi-channel design providing SATA or Ultra DMA performance to deliver the fastest, highest capacity, and smallest storage solution available in the industry today.

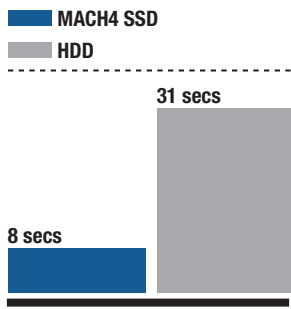
Features

- Ultra-compact footprint – 1-inch Form Factor
- SATA-I, Ultra DMA and MWDMA
- Capacities up to 32GB (Formatted Capacities may vary)
- Full RoHS 6/6 compliance
- Optional security features including AES encryption, write-protect, and data purge
- Lower power, reduced latency, and faster boot times compared to traditional hard disks
- Commercial and Industrial Operating Temperature Range
- SATA and ATA support
- Built-in power-down data protection
- Built-in Wear Leveling and Block Management for ultra-high endurance
- Full data-path protection with built-in 8-bit ECC engine for highest reliability

Product Specifications

Product Type	MACH4 SSD
Capacity	Up to 32GB (Unformatted)
Interface (Type)	SATA 1 / ATA-7 CompactFlash
Transfer modes:	UDMA 0-6, MWDMA 0-4 PC Card Memory, PC Card I/O, True IDE and Ultra DMA
Performance (To/From Host)	
Sustained Read	Up to 90MB/sec
Sustained Write	Up to 55MB/sec
Environmental Temperature	
Commercial	0° to 70°C
Industrial	-40° to 85°C
Reliability	
MTBF (Mean Time Between Failure)	greater than 8,000,000 hours
Non-Recoverable Error Rate	less than 1 in 10 ¹⁴ bits read
Dimensions	36.4mm (L) x 42.8mm (W) x 3.3mm (H)
Compliance	RoHS-6, UL 60950, FCC – Class B for Information Technology, CE – EN 55022/55024, CFA 4.1 Compatible

MACH4 CF vs. HDD Comparison



Boot Up Speed Chart

PRODUCT KEY

Part #: SLCFxGM4U(I)

Examples:

x =	Capacity (8,16, 32 GB)	SLCF8GM4U(I) =	8GB MACH4 SSD Card
G =	Gigabyte		Industrial Temperature
U =	RoHS-6 Compliant		
I =	Industrial Temperature		

Ultra Mobile Solid State Drive (UM-SSD)

Leveraging STEC's proprietary, high performance MACH4 SSD controller, the Express Mini Card offers extremely high-performance (up to 85MB/s) and high capacities up to 32GB. The result is a no-compromise solid state storage solution providing ultra-mobile system designers with a true plug-n-play storage device, allowing for short design cycles and fast time to market. Because the MACH4 PCI Express Mini Card uses NAND flash technology (e.g. no moving parts), it is more reliable and has much lower latency compared to a traditional hard disk drive, while consuming half the power (approximately 1 watt compared to 2 watts for a typical mobile hard disk drive).

STEC's MACH4 PCI Express Mini Card also adheres to the PCI-SIG Express Mini Card mechanical specification as well as industry compliance and regulatory standards including UL, FCC, RoHS, and ATA-7. This combined with a proprietary state-of-the-art flash memory controller supporting key flash management features including advanced wear-leveling and error checking and correction as well as drive monitoring (SMART), provides OEMs with the flexibility to address customer-specific applications with the industry's highest reliability and endurance.

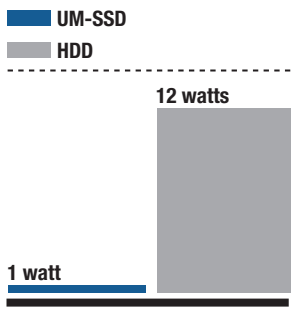
Features

- PCI Express Form Factor
- Built-in power-down data protection
- Full RoHS 6/6 compliance
- Built-in Wear Leveling and Block Management for ultra-high endurance
- Capacities up to 32GB (Formatted capacities may vary)
- Support the use of MLC NAND
- Full data-path protection with built-in 8-bit ECC engine
- Commercial and Industrial Operating Temperature Range

Product Specifications

Product Type	MACH4 SSD
Capacity	Up to 32GB (Unformatted)
Interface (Type)	PATA (UDMA 0-6)
Connector:	PCI Express Mini Card (PCI-S16 1.1)
Performance (To/From Host)	
Sustained Read	Up to 85MB/sec
Sustained Write	Up to 25MB/sec
Environmental	
Shock Tolerance	1500G
Vibration Tolerance	20G
Humidity	85°C 85% RH, 500hrs
Industrial Temperature	-40° to 85°C
Endurance	
Condition	Up to 10 years estimated life in normal operation
Dimensions	50.95mm (L) x 30.00mm (W) x 3.5mm (H)
Compliance	RoHS-6, UL 60950, FCC – Class B for Information Technology, CE – EN 55022/55024

UM-SSD vs. HDD Comparison



Power Consumption Chart

PRODUCT KEY

Part #: SLMPCixGM4U(I)

Examples:

x: Capacity (8, 16, 32GB)
 G: Gbytes
 U: RoHS-6 compliant
 M: MLC

SLMPC18GM4U-M = 8GB MACH4 SSD Card

MACH8^{IOPS}, MACH8, MACH8^{MLC} SOLID STATE DRIVE

STEC MACH8 Solid State Drive series is revolutionizing the storage world by delivering to the users the ultimate level of reliability and performance in a fully integrated device.

At the heart of the MACH8 Family of Solid State Drives is STEC's leading edge flash controller able to address multiple flash components simultaneously to achieve 100MB/s sustainable Read/Write speeds. This same controller allows our MACH8^{MLC} to achieve 90MB/s reads and 60MB/s writes. Providing the world's first cost-effective HDD replacement drive.

The MACH8 product embeds Full Data Path Protection, STEC's proprietary set of algorithms capable of protecting data anywhere within the SSD, from cache to flash.

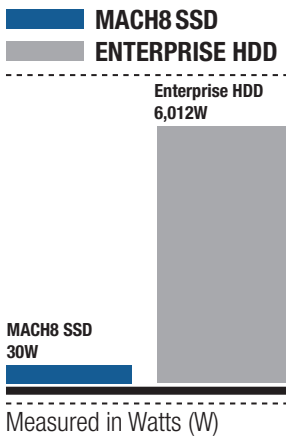
Features

- Industry leading solid state drive
- Full Data Path Protection
- Low power consumption
- Low heat
- Two operating temperature supported:
 - Commercial temperature: 0° to 70°C
 - Industrial temperature: -40°C to 85°C
- IOPS intensive version for transactional heavy applications
- Drop-in replacement for traditional 1.8" and 2.5" drives
- Supports Serial ATA and Parallel ATA
- SLC and MLC support to meet the demands of any application
- Optional support of purge and encryption
- Superior data protection through custom wear leveling to ensure drive endurance

Product Specifications

Product Type	MACH8 ^{IOPS} SSD	MACH8 SSD	MACH8 ^{MLC} SSD
Capacity (Unformatted)	up to 200GB	up to 256GB	up to 512GB
Interfaces	Serial ATA	Serial ATA / PATA	Serial ATA / PATA
Performance			
External Transfer Rate	1.5 Gb/sec (SATA) 133 MB/sec (PATA)	1.5 Gb/sec (SATA) 133 MB/sec (PATA)	1.5 Gb/sec (SATA) 133 MB/sec (PATA)
Sustained Throughput			
Read	100 Mbytes/sec	100 Mbytes/sec	90 Mbytes/sec
Write	80 Mbytes/sec	100 Mbytes/sec	60 Mbytes/sec
Random Operations			
Read	15,000/sec	5,000/sec	-
Write	1,500/sec	100/sec	-
Latency	100µs	100µs	100µs
Physical			
Form Factor	2.5-inch	2.5-inch 1.8-inch	2.5-inch 1.8-inch
	2.5-inch Dimensions: 100.2mm (L) x 69.8mm (W) x 9.5mm (H)		
	1.8-inch Dimensions: 71.0mm (L) x 54.0mm (W) x 5.0mm (H)		

Energy Consumption for 100K Read IOPS



PRODUCT KEY

Part #: M(8)i(I)(IR)FF-(xxx)UTM-(XXX)

M8 = MACH8
I = Interface
S: SATA
A: ATA

i = IOPS SSD (Blank = Standard)
IR = Interface Revision
A: 1.0Gb
B: 1.5Gb
D: 3.0Gb

xxx = Capacity
FF = Form Factor (Z-height)
1: 1.8-inch (5.0mm)
1A: 1.8-inch (7.0mm)
2: 2.5-inch (9.5mm)
2B: 2.5-inch (14.5mm)

U = RoHS Compliant

M = MLC (blank for SLC)
T = temp
C: Commercial
I: Industrial

XXX = Customer Specific (Internal Use Only)

why STEC

STEC is a world wide technology provider of OEM memory and solid state storage solutions that empower our partners to achieve the highest level of system performance. As a leader in OEM SSD/Flash and DRAM memory technology for over 18 years, STEC has developed a solid foundation of quality and value. We are proud to provide our customers with a comprehensive array of support, experience, and knowledge.

STEC's Value Proposition:

INNOVATION | RELIABILITY | QUALITY | SUPPORT | COMMITMENT | EXPERIENCE | KNOWLEDGE | TRUST

Breadth of Products

- Industry's widest range of SSD Products
- Extensive interface expertise and support on FC, SAS, SCSI, SPI, SATA, ATA, PCIeexpress, CF, USB, SD Products
- Specialty form factors (VLP, mini-DIMM, So-RDIMM)
- Legacy products (EDO and FPM)
- Industrial temperature products

Sales Service and Support

- Faster answers to technical questions by our skilled FAEs
- Knowledgeable support and experience on industry standards
- Expert advice from industry-leading engineers to assist in system design decisions
- Sales offices worldwide and local support for all regions

Vendor Independence

- Better continuity of supply
- Unbiased information on different component manufacturers
- Better pricing flexibility

Associations

Member of:

- JEDEC
- SecureDigital Association (SDA)
- CompactFlash Association (CFA)
- MMC Association (MMCA)
- ONFI
- SCSI Trade Association
- Member of T10 and T13
- Microsoft Certified (MSFT)
- Designs Qualified by Intel Designated Test Laboratory (CMTL)
- USB Implementer Forum
- PCMCIA.org
- SATA-IO
- IDEMA
- SNIA
- TCG
- FCIA
- IEEE

Test

- Proprietary test systems and processes designed to ensure optimal product reliability
- TDBI (Test During Burn-In)
- Industrial Temperature Testing/Environmental Testing

In-House Manufacturing

- Faster time-to-market
- Dock-to-stock delivery
- Kanban ID system
- In-house controlled BOM

Responsiveness and Flexibility

- Fast turn-around for production orders
- Chip stacking performed in-house
- Global manufacturing facilities

Customization

- Special security features
- Labeling
- Testing
- Locked Bill of Materials
- Custom module designs
- Serialization

Quality

- ISO9001
- ISO14001

Compliance

- UL approved
- RoHS Compliant
- CE
- FCC
- BSMI
- TUV
- WEEE
- CTICK
- MIC
- CSA
- VCCI
- China RoHS

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