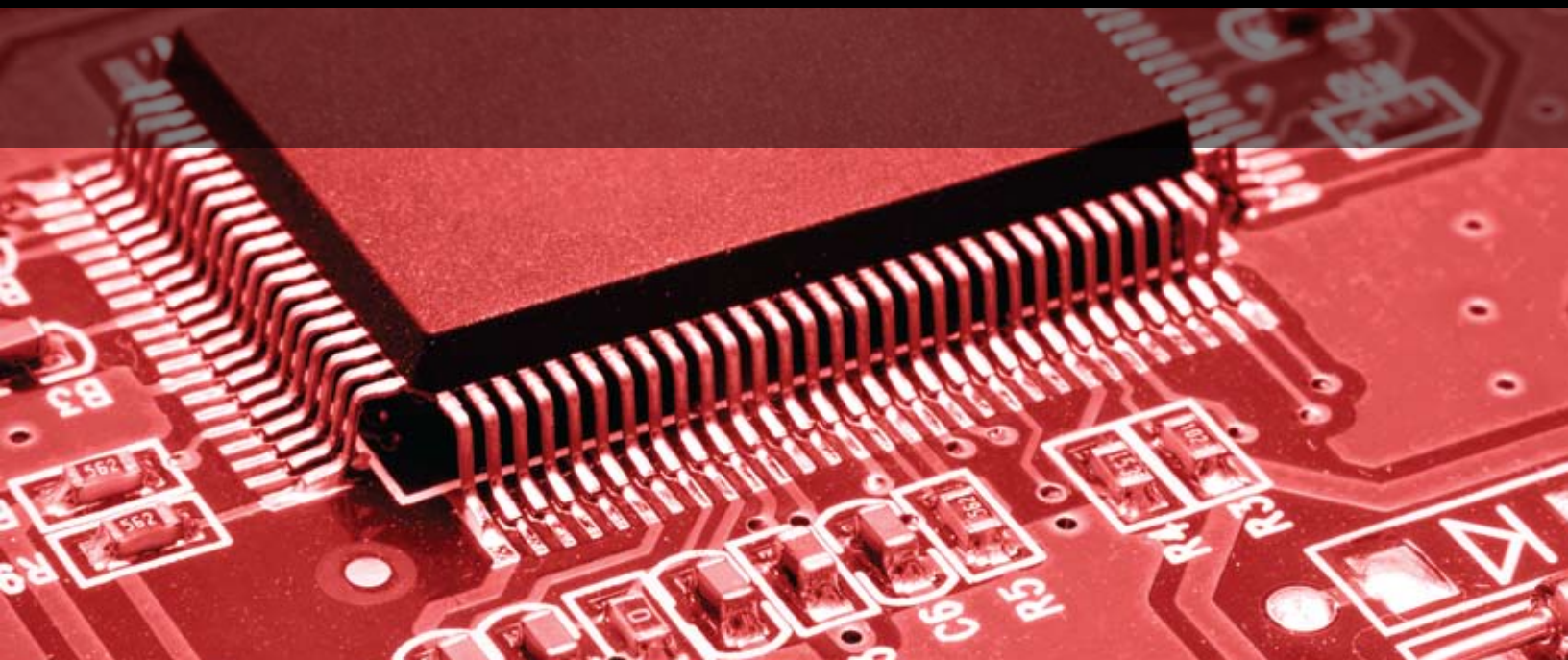


FLASH EMBEDDED SSD OVERVIEW

Industrial Grade Flash Storage Solutions



[SlimSATA](#) [CFast™](#) [UM-SSD](#) [MACH4 CompactFlash](#) [CompactFlash](#) [Flash Module](#) [Flash Drive](#)



SLIM SATA SSD

As serial ATA continues replacing parallel ATA in industrial and embedded system designs, the need for small-format storage designs supporting SATA will become increasingly important. With its industry-standard SATA interface, small footprint, and high performance, STEC's line of Embedded SSDs make an attractive hard disk drive replacement for many industrial/embedded applications.

As with all of STEC's solid state storage solutions, the benefits of Embedded SSDs over rotating media includes lower power consumption, lower latency, higher reliability (as a result of no moving parts), and smaller footprint enabling smaller embedded system designs.

CFAST™

The CFast format is a ratified Compact Flash Association and SATA-IO standard offering the same dimensions as standard Compact Flash but with a SATA interface. With its small footprint and rugged shielded case design, the CFast format is an ideal fit for embedded solid state storage applications (e.g. small HDD replacement, boot module for virtualization applications, performance caching, etc.) that require a very small storage footprint, lower capacities, and high tolerance to extreme environmental conditions. Because the CFast solution is designed for fixed and removable applications, it makes an ideal solution for applications requiring frequent field updates/upgrades or any other situation where frequent handling of the storage device may occur.

Leveraging high performance industrial SSD grade controllers and flash management, the Slim SATA and CFast™ design offer high-performance and high capacities resulting in a no-compromise solid state storage solution providing embedded system designers with a true plug-n-play storage device, allowing for short design cycles and fast time to market.

SLIM SATA SSD FEATURES

- JEDEC and SATA-IO Compliant for greatest compatibility
- Industry standard formats with multi-channel flash support
- Industrial Grade controllers designed for highest reliability
- Built-in Wear Leveling and Block Management for ultra-high endurance
- Data integrity assured via independent ECC engines
- Compact designs with low power consumption
- Commercial and Industrial Operating Temperature Range
- Full RoHS 6/6 compliance

CFAST™ FEATURES

- Standard CFast compliant SATA connector
- Support use of SLC and MLC NAND
- Full RoHS 6/6 compliance
- Built-in Wear Leveling and Block Management for ultra-high endurance



SLIM SATA

CFAST™

CAPACITY (Unformatted)

Up to 64Gbytes

Up to 32Gbytes

INTERFACE

SATA (22pin)

SATA (24pin)

PERFORMANCE (Sustained)

Up to 138MB/s (Read)
Up to 130MB/s (Write)

Up to 138MB/s (Read)
Up to 130MB/s (Write)

PHYSICAL

2.13in (L) x 1.5in (W) x 0.15in (H)
54mm (L) x 39.0mm (W) x 4.0mm (H)

1.43in (L) x 1.68in (W) x 0.14in (H)
36.4mm (L) x 42.8mm (W) x 3.6mm (H)

ENVIRONMENTAL

0°C to 70°C (Commercial)
-40°C to 85°C (Industrial)

0°C to 70°C (Commercial)

COMPLIANCE

RoHS-6, UL 60950, FCC - Class B for Information Technology, CE - EN55022/55024, SATA 2.6, MO-297

RoHS-6, UL 60950, FCC - Class B for Information Technology, CE - EN55022/55024, SATA 2.6, CFAST™ 1.0

MACH4 COMPACT FLASH

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.

MACH4 COMPACT FLASH FEATURES

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

MACH2 COMPACT FLASH

Revolutionizing the way CompactFlash is used, STEC's new MACH2 CompactFlash platform is a high-performance industrial NAND flash storage device suitable as a hard disk drive replacement or alternate storage device in a wide variety of industrial applications.

Because the MACH2 CompactFlash uses solid state NAND flash technology, it has very low latency compared to a traditional hard disk drive, consumes far less power (approximately 200 milliamps or 1 watt compared to 12 watts for a standard 7200rpm ATA disk drive), and performs much better under extreme environmental conditions.

With its small footprint, high capacity (up to 32 gigabytes using MLC flash), and throughput up to 40 megabytes per second, the MACH2 CompactFlash is an ideal hard disk drive replacement. The MACH2 is especially well suited for space-constrained or rugged applications or those requiring less capacity than available hard disk drives offer including blade servers and embedded PCs.

MACH2 COMPACT FLASH FEATURES

- CFA Compliant for greatest compatibility
- Type 1 CompactFlash card with independent flash channels
- ATA and True IDE Mode Support
- Ultra DMA
- Capacities up to 16GB (SLC Flash)
- 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
- Built-in power-down data protection
- Commercial and Industrial Operating Temperature Range
- Full RoHS 6/6 compliance



PRODUCT SPECIFICATIONS

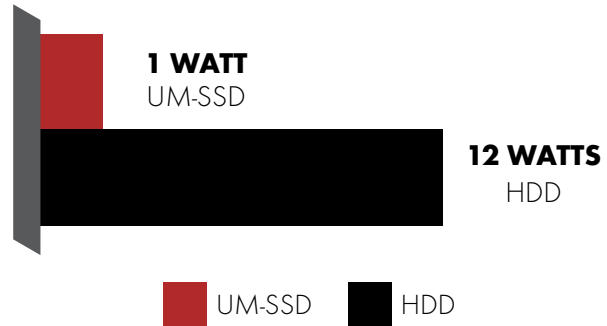
	MACH4	MACH2
CAPACITY (Unformatted)	Up to 32Gbytes	Up to 16Gbytes
INTERFACES	ATA-7/Compact Flash	Type ATA with True IDE Mode Support Connector 50 Pin CF Interface
TRANSFER MODE	UDMA-0-6, MWDMA 0-4, PC Card I/O PC Card Memory, True IDE & Ultra DMA	UDMA-0-6, MWDMA 0-4, PIO 0-6 PC Card Memory, PC Card I/O, True IDE & Ultra DMA
PERFORMANCE (To/From Host)		
Sustained Read	Up to 90MB/sec	Up to 40MB/sec
Sustained Write	Up to 55MB/sec	Up to 29MB/sec
ENVIRONMENTAL		
Shock Tolerance	1500G	1500G
Vibration Tolerance	20G	20G
Industrial Temperature	-40°C to 85°C (Commercial 0°C to 70°C)	-40°C to 85°C (Commercial 0°C to 70°C)
ENDURANCE		
Condition	Greater than 8,000,000 Hours	Greater than 8,000,000 Hours
Dimensions	36.4mm (L) x 42.8mm (W) x 3.3mm (H)	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	RoHS-6, UL 60950, FCC-Class B for Information Technology, CE-EN 55022/55024, CFA 4.1 Compatible, PCMLA 7.0 Compatible

UM-SSD

Leveraging STEC's proprietary, high performance MACH4 SSD controller, the Ultra Mobile Solid State Drive (UM-SSD) 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 UM-SSD 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).

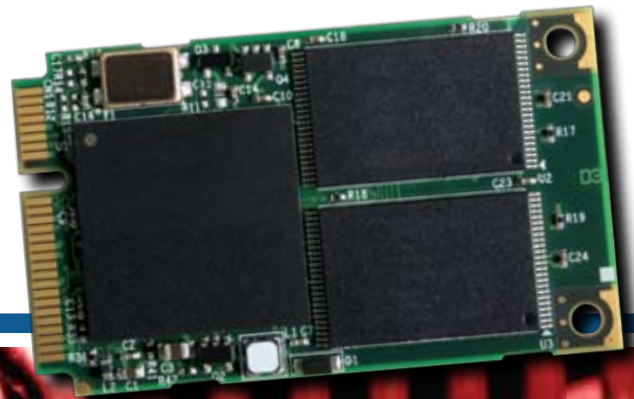
STEC's UM-SSD also adheres to the PCI-SIG Express Mini Card mechanical specification as well as industry compliance and regulatory standards including UL, FCC, RoHS, and ATA-7. This combined with a proprietary state-of-the-art flash memory controller supporting key flash management features including 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.

UM-SSD VS. HDD COMPARISON POWER CONSUMPTION CHART



UM-SSD FEATURES

- PCI Express Mini Card Form Factor
- Capacities up to 64GB (Formatted capacities may vary)
- Built-in power-down data protection
- Support the use of MLC NAND
- Full RoHS 6/6 compliance
- Full data-path protection with built-in 8-bit ECC engine
- Built-in Wear Leveling and Block Management
- Commercial and Industrial Operating Temperature Range for ultra-high endurance



PRODUCT SPECIFICATIONS

UM-SSD

CAPACITY (Unformatted)	Up to 64Gbytes
INTERFACE (Type)	PATA (UDMA 0-6)
CONNECTOR	PCI Express Mini Card (PCI-s16 1.1) PC Card I/O, True IDE & Ultra DMA
PERFORMANCE (To/From Host)	
Sustained Read	Up to 82MB/sec
Sustained Write	Up to 25MB/sec
ENVIRONMENTAL	
Shock Tolerance	1500G
Vibration Tolerance	20G
Industrial Temperature	-40°C to 85°C
ENDURANCE	
Condition	Greater than 8,000,000 Hours
Dimensions	50.95mm (L) x 30.0mm (W) x 3.5mm (H)
Condition	RoHS-6, UL 60950, FCC - Class B for Information Technology, CE - EN 55022/55024

USB FLASH MODULE

USB Flash Module (UFM) provides non-volatile, solid-state storage in a compact design, making it perfectly suited for embedded applications. STEC's patented IC Tower® Stacking Technology make it possible to provide the UFM in capacities up to 16GB, the highest in the industry. The standard USB 2.0 interface provides designers with a true plug-n-play storage device, allowing for short design cycles and fast time to market.

STEC's proprietary, state-of-the-art USB 2.0 flash memory controller is incorporated in the UFM, providing high data reliability and endurance. The built-in ECC engine ensures data integrity, while sophisticated wear leveling algorithms guarantee 2,000,000 Write/Erase Cycles. The embedded password protection feature provides the security needed for most industrial applications.

USB FLASH MODULE FEATURES

- USB 2.0 high speed interface
- Capacity: 1GB - 16GB
- IC Tower® Stacking Technology
- Password protection
- Unique serial number
- Built-in wear leveling
- Endurance guarantee of 2,000,000 write/erase cycles
- Built-in 12-bit ECC engine
- Commercial and industrial operating temperature range
- Bootable



USB FLASH DRIVE

STEC's Industrial Grade USB Flash Drive (UFD) is more than just portable storage. Tailored for Industrial Applications that require high reliability and data throughput, it provides non-volatile, industrial grade solid-state storage in a thumb-drive package. In addition, laser-etched manufacturing information allows for lot traceability and complete info on the Bill of Materials.

STEC's proprietary state-of-the-art USB 2.0 flash memory controller is incorporated in the UFD, providing high data reliability and endurance. The built-in ECC engine ensures data integrity, while sophisticated wear leveling algorithms guarantee 2,000,000 Write/Erase Cycles. The Password Protected Secure Partition provides the security needed for most industrial applications.

The Industrial Grade UFD includes an ESD-rated enclosure for applications that require NEBS Level 3 compliancy. The ESD-rated enclosure has been tested for immunity from ESD for 8KV contact and 15KV air.

USB FLASH DRIVE FEATURES

- USB 2.0 high speed interface
- Laser etched manufacturing Info
- Lot traceability
- NEBS level 3 compliant for ESD
- Password protection
- Unique serial number
- Built-in wear leveling
- Endurance guarantee of 2,000,000 write/erase cycles
- Built-in 12-bit ECC engine
- Commercial and industrial operating temperature range
- Customizable for logo/graphic design
- Capacity: 1GB - 8GB



PRODUCT SPECIFICATIONS

UFDM UM-SSD

UFD UM-SSD

CAPACITY (Unformatted)	Up to 16Gbytes	Up to 8Gbytes
INTERFACES	2x5 Header, x86 Internal USB Standard Horizontal, Low Profile	USB 1.1, USB 2.0
TRANSFER MODE	UDMA 0-6, MWDMA 0-4, PIO 0-6 PC Card Memory, PC Card I/O, True IDE & Ultra DMA	-
PERFORMANCE (To/From Host)		
Sustained Read	Up to 30MB/sec	Up to 30MB/sec
Sustained Write	Up to 20MB/sec	Up to 20MB/sec
ENVIRONMENTAL		
Shock Tolerance	1500G	1500G
Vibration Tolerance	20G	20G
Industrial Temperature	-40°C to 85°C	-40°C to 85°C
ENDURANCE		
Condition	Greater than 8,000,000 Hours	Greater than 8,000,000 Hours
Dimensions	36.4mm (L) x 42.8mm (W) x 3.3mm (H)	ESD-Rated Enclosure 65.10mm (L) x 16.40mm (W) x 5.50mm (H)
Compliance	RoHS-6, UL 60950, FCC-Class B for Information Technology, CE-EN 55022/55024	RoHS-6, UL 60950, FCC-Class B for Information Technology, CE-EN 55022/55024, USB 2.0

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

About STEC

BREADTH OF PRODUCTS

- Industry's widest range of SSD Products
- Extensive interface expertise and support on FC, SAS, SCSI, SPI, SATA, ATA, PCIe, CF, USB, SD and MMC Products
- Specialty form factors (VLP, mini-DIMM, So-RDIMM)
- 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

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
- World Class QA Traceability
- 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
- MCI
- TUV
- CSA
- WEEE
- CTICK
- China RoHS
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