ORANGE Series

Rugged 1.8" SATA SSD

OVERVIEW

The 1.8" SATA is the smallest standard SSD form factor where the printed circuit board assembly (PCBA) is protected by an outer case. While narrower, shorter and smaller than standard 2.5" form factor, it can house similar number of NAND chips, hence provide similar capacity. For rugged applications, since the outer case is screwless, it mounts with the use of brackets or rail. This facilitates heat dissipation, provides effective constraints against vibration, and also simplifies its use as a removable SSD. This is an advantage as compared to M.2 and mSATA form factors that while small, are not designed for removable storage applications. The micro SATA 7+9 connector, primarily for SATA signal and power, can be used to provide hardware controlled features such as write protect and data elimination.

MEMKOR M+ SECURITY - CUTTING-EDGE DATA PROTECTION

Memkor's ORANGE Series 1.8" micro SATA SSDs ensure Data at Rest (DAR) protection through the embedded FIPS 197 validated encryption engine. Iis design and architecture are based on the Memkor Orange Series models models validated under FIPS 140-2, Level 2 program that includes strength testing of algorithms and methods used to authenticate users, safe-keeping of security parameters and anti-tempering measures.
The encryption management are either FIPS validated procedures or TCG OPAL method. Both use the concept of Shadow MBR thus allowing for pre-boot authentication and the use of the SSD as a boot drive.

Data protection includes a Write Protect function option which ensures data integrity and prevents malicious or accidental Data alteration. The Write Protect function can be enabled and disabled by the user through software or hardware triggering.

RELIABILITY

Through the use of the highest reliability MLC and SLC NAND, combined with the state of the art flash management techniques, strong EDC/ECC/CRC, end-to-end data protection strategy and sudden power loss safeguards integrated in software and hardware, Memkor's ORANGE Series SSDs provide the highest level of reliability, durability and endurance.

CLIENT or ENTERPRISE CLASS OPERATIONS

Designed for compact rugged applications, Memkor's ORANGE Series 1.8" micro SATA SSDs can be optimized for Client operations such as boot drives or Enterprise class operations to maximize performance and reduce latencies.

SUMMARY

- □ 1.8" form factor
- □ SATA 6G, 3G, 1.5G
- □ Client and Enterprise versions

1.8" SATA FORM FACTOR (FF) APPLICATIONS

- □ Similar capacity as 2.5" FF in half the volume
- □ Only slightly higher profile than bare board M.2 or mSATA FF SSDs
- □ Boot drive and/or data recorder
- □ Adequate for Military grade shock and vibration ruggedization level
- □ Adequate for high performance in extreme temperature applications
- □ Small dimension removable storage

MEMKOR 1.8" ORANGE SERIES ADDED VALUE

- □ All models FIPS 197 validated
- □ Architecture based on FIPS 140-2 Level 2 validated 2.5" SATA SSDs
- □ Optional TCG OPAL
- □ HW or SW triggered Crypto and Secure Erase
- □ HW or SW enabled Write Protect
- □ Use of high reliability components
- □ End-to-end Data protection
- □ End-to-end operation monitoring
- □ Sudden power loss safeguards
- □ Standard conformal coating on Industrial/ Military grade SSD
- □ Excellent for extreme temperature operations
- □ Each SSD thoroughly tested
- □ Locked BOM and obsolescence management
- □ Optional custom firmware and features
- □ 5 year/TBW warranty

Secure — Rugged — Reliable

ABOUT ORANGE SERIES

Memkor's 3rd generation Orange Series SATA and PCIe SSDs aim to provide the highest throughput performance combined with the highest capacities available in the standard form factors. They are built with high quality industrial grade MLC, pSLC NAND or the most reliable SLC NAND available today. With carefully selected BOM and mature firmware, it is backed by 5 year limited warranty. The family supports SATA, PCIe/NVMe, USB, SAS or PATA interface. All Memkor products are available with locked BOM configurations and Supply Chain component management for long-term deployment applications.

MEMKOR—PART OF YOUR PROJECT

- ☐ We will support your design process
- ☐ Each SSD undergoes ESS test
- ☐ We offer Locked BOM Management
- ☐ We offer obsolescence management

MEMKOR 1.8" ORANGE SERIES micro SATA SSD SPECIFICATION

Form Factor	• Standard 1.8" micro SATA
Dimensions	• 78.2 mm L x 54.0 mm W x 5.0 mm H
Interface	• SATA 6G/3G/1.5G
Data throughput	• SATA 6G: up to 500/550 MB/s Write/Read • SATA 3G: up to 250/250 MB/s Write/Read
Maximum Capacity	• up to 1,024 GB MLC NAND • up to 512 GB pSLC NAND • up to 256 GB SLC NAND
Temperature Range	• -40°C to 85°C Industrial/Military • 0°C to 70°C Commercial
Vibration/shock	• 16.3 GRMS 10-2000Hz / 50G 11 ms
Data Reliability	• Flash managed by static and dynamic wear leveling and powerful ECC/CRC • End-to-end Data Protection • Uncorrectable bit error rate (UBER): less than 10^{-16}
Data Retention	• 1 year at 30°C when power off and TBW reached[2]
Endurance[2]	• 400 TBW (256 GB MLC NAND) • 4,100 TBW (256 GB pSLC NAND) • 12,800 TBW (256 GB SLC NAND)
Data Security	• FIPS 197 validated • Optional FIPS 140-2 compliant • Optional TCG OPAL V2.0 Self Encrypted Drive (SED) • Military grade Data Elimination • HW and/or SW Write Protect
Component reliability	• MTBF: >1,000,000[3]
Health monitoring	• S.M.A.R.T. to report system health • Thermal performance monitoring and management

(1) Selected models
(2) Per JEDEC219. Contact Memkor for TBW for other capacities and specific workloads.
(3) Contact Memkor for MTBF prediction for specific environmental conditions and field MTBF data.
(4) Per JESD47/JEP122. Contact Memkor for Data Retention prediction for your application.

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Memkor® is an American engineering company dedicated to providing flash solid state storage solutions for defense, industrial and enterprise applications. We create secure, reliable, robust and innovative solutions with rich feature sets, tailored, as required, to meet your technology investment objectives. We are dedicated to delivering on our promises. We simply believe that your satisfaction enables the continuous success of our company.

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