

Industrial pSLC mSATA SSD

MSA550 SERIES

SATA III

6.0 Gbit/s

SLC Cache

pSLC NAND



PRODUCT FEATURES

- High-Quality pSLC Flash Technology
- Global Wear Leveling and Early weak block retirement
- TRIM, NCQ, DEVSLP, ATA Security Feature Set supported
- Lifetime Enhancements

Direct-to-TLC and SLC Cache enhancement to ensure the optimized WAF

Block/Page RAID function to ensure data recovery

StaticDataRefresh to keep data integrity

Reliable Industrial grade integrated Active PMU and complete protection design with OVP, OCP, Surge rejection and Short protection

- External DRAM to achieve the optimal sustained read/write performance
- Power shielding firmware architecture to ensure power failure resilience
- AES256 Encryption and TCG Opal 2.0 compliant (by request)
- SP SMART Toolbox
- SP SMART Embedded and SMART IoT service (by request)

PRODUCT SUMMARY

- Capacities : 32GB, 64GB, 128GB
- Form Factor : mSATA Solid State Drive (51 mm x 30 mm x 3.5 mm)
- Compliance : SATA Revision 3.1 - 6 Gbit/s (3 Gbit/s and 1.5 Gbit/s backward compatible)
- Command Sets : Supports ATA/ATAPI-8 and ACS-2
- Performance :

	32GB	64GB	128GB
Sequential Read (MB/s Max.)	560	560	560
Sequential Write (MB/s Max.)	410	520	520
Random 4K Read (IOPS Max.)	66000	92000	82000
Random 4K Write (IOPS Max.)	85000	88000	88000

* Actual performance may vary based on the specific model and capacity

- Operating Temperature Range :
Normal : 0°C to 70°C
Extended : -15°C to 85°C (by request)
Wide : -40°C to 85°C (by request)
- Storage Temperature Range : -55°C to 95°C
- Operating Voltage : 3.3V ± 10%
- Power Consumption :

(Unit: mA)	32GB	64GB	128GB
Read (Max.)	340	350	365
Write (Max.)	340	395	432
Stand-by (Avg.)	90	90	90

* Actual value may vary based on the specific model and capacity

- Data Retention @40 °C : 10 Years @ Life Begin; 1 Year @ Life End
- Endurance in Tera Bytes Written (TBW) : (Unit: TB)

Workload	32GB	64GB	128GB
Sequential	937	1875	3750
Enterprise	147	295	589

TBW is estimated by formula $TBW = (Capacity \times PE \text{ Cycles}) \times (1+OP) \times (WLE) / (WAF)$

OP (Over Provision) = (Physical Capacity / Logical Capacity)-1

WAF = Write Amplification Factor

WLE = Wear Leveling Efficiency could be different depended on the workload or usage containing data size and access rate.

Sequential workload: Sequential write workload which is generated by VDBENCH script and tested by VDBENCH

Enterprise workload: Follow JESD219A enterprise workload which is generated by VDBENCH script and tested by VDBENCH.

- Mechanical (IEC-60068) :

Vibration : 15G, 10 ~ 2001Hz

Drop : 76cm

Shock : 1,500G@0.6ms

- LDPC ECC engine and Block/Page RAID to ensure reliable 30K PE cycles
- Mean Time Between Failure : > 2,000,000 hours
- Data Reliability: Non-recover Read (UBER) $\leq 10^{-16}$
- Serious quality control and assurance
100% NAND Flash screening
High endurance product design with 3D NAND and pSLC product offerings
Implement high/low temperature dynamic burn-in in each lot production to monitor production quality to meet design specification
Reliability criteria compliant with international standards IEC-60068/61000