Silicon Power
INDUSTRIAL

Industrial pSLC NAND 2.5" SATA SSD

SSD500 SERIES

SATA III	6.0 Gbit/s
SLC Cache	pSLC NAND

PRODUCT FEATURES

- High-Quality pSLC Technology
- Global Wear Leveling and Early weak block retirement
- TRIM, NCQ, DEVSLP, ATA Security Feature Set supported
  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 (R/S series)
- Power shielding firmware architecture to ensure power failure resilience
- Dual secure design with Advanced PFP (Power failure protection) technology to flush Data from DRAM cache to flash with dedicated polymer capacitor components while sudden power-off situations happen (R Series only)
- AES256 Encryption and TCG Opal 2.0 compliant (by request)
- SP SMART Toolbox
- SP SMART Embedded and SMART IoT service (by request)
- Ready for harsh environment design (R Series only)
  compliant with MIL-STD-810F and MIL-STD-460D for Industrial R series

PRODUCT SUMMARY

- Capacities : 16GB, 32GB, 64GB, 128GB, 256GB, 512GB
- Form Factor : 2.5" SATA Solid State Drive (70 mm x 100 mm x 7 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 :

	16GB	32GB	64GB	128GB	256GB	512GB
Sequential Read (MB/s Max.)	270	480	520	520	520	520
Sequential Write (MB/s Max.)	100	100	190	400	400	360
Random 4K Read (IOPS Max.)	26000	51000	72000	79000	73000	73000
Random 4K Write (IOPS Max.)	11000	23000	47000	73000	73000	72000

** 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 : 5 V ± 10%
- Power Consumption :

(Unit: mA)	16GB	32GB	64GB	128GB	256GB	512GB
Read (Max.)	190	260	275	330	360	330
Write (Max.)	160	360	380	570	790	730
Stand-by (Avg.)	90	90	90	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	16GB	32GB	64GB	128GB	256GB	512GB
Sequential	154	309	617	1235	2470	4940
Enterprise	TBD					

TBW is estimated by formula **TBW = (Capacity x PE Cycles) x (1+OP) x (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
- BCH ECC up to 66 bits/1K to ensure reliable 20K PE cycles
- Mean Time Between Failure : > 2,000,000 hours
- Data Reliability: Non-recover Read (UBER) ≤10^{-16}
- Serious quality control and assurance
  100% NAND Flash screening
  High endurance product design with SLC 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