

## Industrial pSLC NAND

microSD CARD

# SDT5R0 SERIES

SD 3.0

UHS-I

30K PE Cycles

pSLC NAND



## PRODUCT FEATURES

- pSLC Flash Technology with 30K PE cycles endurance
- Global Wear Leveling, Static & Dynamic Wear Leveling and Early weak block retirement to ensure an even level of wearing out
- LDPC ECC engine with hardware decode, read retry & software decode capable of correcting error to 125 bits/KB to guarantee 30K PE cycles with pSLC Flash for 3D NAND
- Offline training with AI for firmware to monitor the status of 3D NAND dynamically to determine the optimized parameters for LDPC ECC software decode.
- Sudden Power-Off Recovery (SPOR) resilient firmware with capability to avoid firmware crash when sudden power loss or unstable voltage occurs during operation mode and device initialization stage.
- Auto Read-Refresh, Read retry, Garbage collection to ensure reliability and optimized performance
- SP Toolbox utility program to monitor Overall health status, Power Cycle count, Abnormal power cycle count, Bad block status including initial bad blocks, later bad blocks and spare blocks, Erase counts, ECC Uncorrectable counts.
- SP SMART Embedded applications with seamless integration with an edge's device operating system.
- SP SMART IoT Sphere providing cloud service with alarm and notifications which monitors and analyzes the health and status of SP Flash products inside the connected devices.

# PRODUCT SUMMARY

- Capacities : 8GB,16GB,32GB,64GB
- Form Factor : microSD Card
- Compliance : SD Specification: SD 3.0 UHS-1
- Speed Class: Class 10, U3
- Performance :

	8GB	16GB	32GB	64GB
Sequential Read (MB/s Max.)	93.3	93.5	93.4	93.4
Sequential Write (MB/s Max.)	74.0	75.5	78.8	80

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

- Operating Temperature Range :  
Extend: -25 °C to 85 °C
- Storage Temperature Range: -40 °C to 85 °C
- Operating Voltage: 3.3 V ± 10%
- Power Consumption (Maximum, unit: mA)

Read : 100mA

Write: 100mA

Stand-by: 0.3mA

\* 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	8GB	16GB	32GB	64GB
Sequential	150.14TB	300.28TB	600.56TB	1201.12TB
Enterprise	34.03TB	68.06TB	136.12TB	272.23TB

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 (SDA Spec) :

Bare Drop: 150cm free fall 6 faces

Torque: 0.15N

Bending: 10N-m

- LDPC + AI ECC up to 125 bits/1KB to ensure reliable 30K PE cycles with pSLC Flash
- Mean Time Between Failure: > =2,000,000 hours
- Serious quality control and assurance

100% NAND Flash screening

Duration: 10,000 cycles

Compliant with SDA Spec. ISO 7816-1 to pass UV light exposure and X-ray exposure

Reliability criteria compliant with international standards IEC-60068 (Environmental test) and IEC-61000-4-2 (ESD, Contact +/-4KV, Air discharge +/-8KV)