



PS3111-S11T

Phison PS3111-S11T (Phison S11T) is a mature NAND controller IC solution operating on SATA 3 6.0Gb/s interface. Without on-board DRAM, its single-core hardware design includes 2 flash channels with 16 Chip Enable (CE) counts to sustain both performance and affordability. Complementing its conventional SATA design, Phison's proprietary data compression and protection technology provides a lift to the read and write efficiency while maintaining robust overall reliability.

Application

Embedded and OEM SSD

Client SSD Products

Industrial SSD Products



Product Features

Flash and Form Factor Versality

Not only does PS3111-S11T accommodate a wide variety of solutions from NAND flash vendors, but it also complements its NAND flash adaptability with its diversity in enabled module form factors to add to the deployment flexibility within consumer platforms and applications.

End-to-End Data Path Protection

From the entry through PHY to the access of NAND flash memory, data packages go through a series of encryption/decryption using various coding schemes, including but not limited to AES, CRC, and SEDEC, to gain a multi-layered protection over the course of delivery.

Phison 2nd Gen LDPC ECC Engine

Phison's proprietary second-generation ECC engine based on the LDPC coding scheme effectively maintains NAND flash data reliability. Relative to the prior generation, the 2nd Gen engine has not only become more cost effective but also ready for soft-bit decoding that is higher in correction strength.

SmartZIP™

A compression technique to improve SSD write performance by eliminating redundancy in data patterns and thus the amount of physical transaction flow. It also benefits the overall drive endurance as the amount of write operations directly impacts the wear and tear of flash cells.

CONTROLLER

PS3111-S11T

Features	Specifications
Host Interface	<ul style="list-style-type: none"> - SATA III (Bandwidth: 6Gb/s) - Compliance with SATA Revision 3.2
Processor	<ul style="list-style-type: none"> - Single-CPU architecture with built-in 32-bit microcontroller - UMC 40nm process technology
Flash Controller	<ul style="list-style-type: none"> - Up to 2 Channels with 16 Chip Enable (CE) counts - Flash transfer rate up to 533MT/s - Capacity up to 1TB - Support 2D SLC/MLC and 3D TLC/QLC NAND flash memory - Compliance with Toggle 2.0 and ONFi 4.0 - Flash I/O operating voltage supply 1.2V/1.8V
DRAM Controller	<ul style="list-style-type: none"> - DRAM-less
Data Reliability	<ul style="list-style-type: none"> - Phison 2nd generation LDPC ECC engine - End-To-End Data Path Protection
Performance	<ul style="list-style-type: none"> - Sequential Read up to 550MB/s - Sequential Write up to 500MB/s - 4K Random Read up to 90K IOPS - 4K Random Write up to 85K IOPS
Power Management	<ul style="list-style-type: none"> - DEVSLP < 5mW
Temperature Range	<ul style="list-style-type: none"> - Operating range: 0~70 °C - Storage range: -40~85 °C
Package	<ul style="list-style-type: none"> - 169-ball LFBGA, 9 mm x 9 mm
Peripheral	<ul style="list-style-type: none"> - GPIO pins - Built-in JTAG function - Built-in UART function - I2C and SPI for external ROM



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Solutions

PS3111-S11T

SSD Solutions		PS3111-S11T		
Capacity ⁽¹⁾	120/128GB	240/256GB	480/512GB	960/1024GB
Interface	SATAIII 6Gb/s			
Form Factor	M.2 2242/2260/2280, 2.5", Half Slim, mSATA, Cfast, uSSD			
NAND Flash	2D MLC , 3D TLC/QLC			
Performance ⁽²⁾				
Sequential Read	550 MB/s	550 MB/s	550 MB/s	550 MB/s
Sequential Write	465 MB/s	500 MB/s	500 MB/s	500 MB/s
4K Random Read	70K IOPS	75K IOPS	80K IOPS	90K IOPS
4K Random Write	80K IOPS	80K IOPS	80K IOPS	85K IOPS
Power ⁽³⁾				
Supply Voltage	M.2 2242/2260/2280 , mSATA, Cfast, uSSD 3.3V ±5% 2.5", Half Slim 5V ±5%			
Active (Average)	1300mW	1800mW	2000mW	2100mW
Idle	320 mW	335mW	335mW	335mW
DEVSLP ⁽⁴⁾	4.9 mW	4.9mW	4.9mW	4.9mW
Environmental				
Operating Temperature	0°C - 70°C			
Non-Operating Temperature	-40°C - 85°C			
Certification	-RoHS -WHQL			
Reliability & Warranty				
TBW ⁽⁵⁾	60TB	120TB	250TB	500TB
MTBF	2,000,000 hours	2,000,000 hours	2,000,000 hours	2,000,000 hours
UBER	<10 ⁻¹⁵ bits	<10 ⁻¹⁵ bits	<10 ⁻¹⁵ bits	<10 ⁻¹⁵ bits
Advanced Features				
- End-to-End Data Protection - Thermal Monitoring - SmartZIP™				

(1) 1 GB = 1,000,000,000 bytes

(2) Performance is based on CrystalDiskMark 6.0.0, 1GB range, QD=32 for sequential read/write and IOMeter, 1GB range, 4K data size, QD=32 for 4K random read/write.

(3) Power consumption is measured during the sequential read and write operations performed by CrystalDiskMark 6.0.0(1GB range, QD=32T1)

(4) The value of DEVSLP mode is measured while entering device sleep mode for 5 minutes. DEVSLP Mode is the optional function for device.

(5) TBW is Terabytes written and the results are obtained in compliance with JEDEC SSD endurance workload JESD219A.



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