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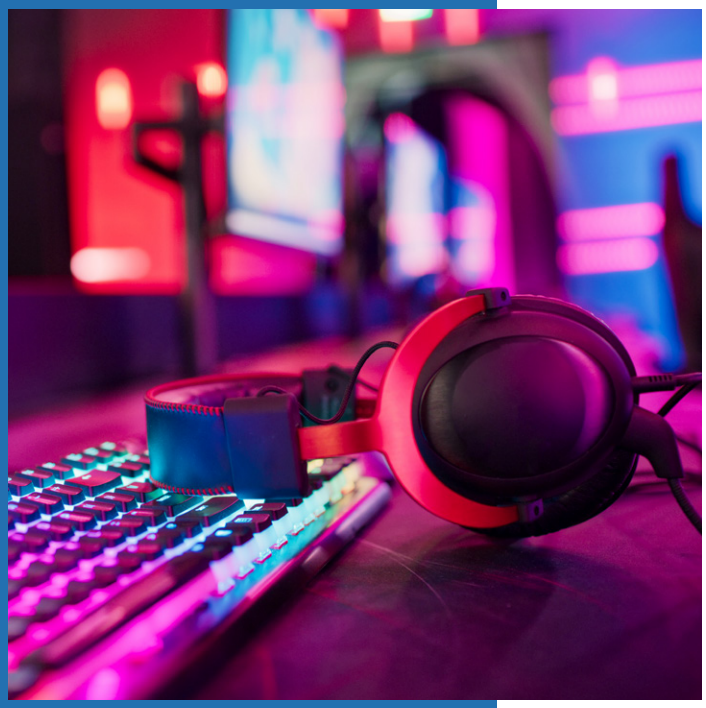

PS5019-E19T

Phison PS5019-E19T is a PCIe 4.0x4 NAND Flash Controller designed for PC and gaming console. Breaking throughput performance barriers with Gen4 interface sets new standards in the user experience. PS5019-E19T also supports advanced power management features which can help to improve power efficiency and prolong the battery life of your devices.

Application

Embedded and OEM SSD

Client SSD products

Gaming console

Product Features

The Best Cost-effective Product in Gen4

PS5019-E19T is an SSD controller that supports 3D TLC NAND Flash without DRAM cache for cost optimizations while it can also deliver high-speed data transmission. It is designed to offer a good balance of performance, reliability, and affordability.

Host Memory Buffer (HMB)

PS5019-E19T supports Host Memory Buffer (HMB) which allows the SSD controller to use a portion of the host system's memory as a buffer. This can help to improve performance by reducing the number of write operations to the flash memory and reducing latency.

Phison 4th Gen LDPC ECC Engine

Phison's proprietary fourth-generation ECC engine based on the LDPC coding scheme effectively maintains NAND flash data reliability. Relative to the prior generation, the 4th Gen engine has not only become more cost effective but also ready for soft-bit decoding that is higher in correction strength.

Strong Security Feature

PS5019-E19T is equipped with multiple security features compliant with industry standards. Along with Phison's proprietary End-to-End Data Path Protection (E2EDPP) design, PS5019-E19T offers comprehensive protection against malware and hacking to eliminate the risk of security breaches.

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Features	Specifications
Host Interface	- PCIe Gen 4x4 (Bandwidth: 16GT/s x4) - Backward compatible with existing PCIe generation transfer rates - Compliance with PCI Express Base Specification Revision 4.0 - Compliance with NVMe 1.4 - Host Memory Buffer (HMB) support
Processor	- Single CPU architecture - TSMC 28nm process technology
Flash Controller	- Up to 4 Channels with16 chip enable (CE) counts - Flash transfer rate up to 1400MT/s - Capacity up to 2TB - Support 3D TLC NAND flash memory - Compliance with Toggle 4.0 and ONFi 4.2 - Flash I/O operating voltage supply 1.2V/1.8V
Data Reliability	- Phison 4th generation LDPC ECC & RAID ECC - End-To-End Data Path Protection
Security	- Pyrite - AES 256 - SHA 512 - RSA 2048
Performance	- Sequential Read up to 3600MB/s - Sequential Write up to 3000MB/s - 4K Random Read up to 500K IOPS - 4K Random Write up to 610K IOPS
Power Management	- L1.2 < 5mW
Temperature Range	- Operating range: 0~70 °C - Storage range: -40~85 °C
Package	- 198 ball, 7mm x 11mm
Peripheral	- Built-in internal thermal sensor - GPIO pins - Built-in UART function - I2C and SPI for external ROM

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Solutions

PS5019-E19T

SSD Solutions	PS5019-E19T			
Capacity [1]	250/256 GB	500/512 GB	1000/1024 GB	2000/2048 GB
Interface	PCIe Gen 4.0 x4 NVMe 1.4			
Form Factor	M.2 2280-S2	M.2 2280-S2	M.2 2280-S2	M.2 2280-D2
NAND Flash	3D TLC	3D TLC	3D TLC	3D TLC
Performance [2][3]				
Sequential Read	3500 MB/s	3600 MB/s	3600 MB/s	3300 MB/s
Sequential Write	2600 MB/s	3000 MB/s	3000 MB/s	3000 MB/s
4K Random Read	400K IOPS	400K IOPS	420K IOPS	380K IOPS
4K Random Write	600K IOPS	550K IOPS	540K IOPS	550K IOPS
Power [4]				
Supply Voltage	M.2 3.3V ± 5%			
Active (Average)	3450 mW	3500 mW	4100 mW	4600 mW
Low Power PS4 (L1.2)	5 mW	5 mW	5 mW	5 mW
Environmental				
Operating Temperature	0°C - 70°C			
Non-Operating Temperature	-40°C - 85°C			
Reliability & Warranty				
TBW [5]	150 TB	300 TB	600 TB	1200 TB
MTBF	1.5 million hours			
UBER	$<10^{-16}$ bits			
Advanced Features				

- End-to-End Data Protection
- TCG Pyrite Support
- Thermal Monitoring

[1] 1 GB = 1,000,000,000 bytes
[2] Sequential Performance is based on CrystalDiskMark 6.0, 1GB range, QD=32T1 , and test drive set as secondary
[3] Random Performance is based on IOMeter, 1GB range, 4K data size, QD=32T16, 4K aligned
[4] Power consumption is measured during the sequential read and write operations performed by CrystalDiskMark with the conditions described in (3).
[5] TBW is Total Bytes Written and the results are obtained in compliance with JESD218 Standards

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