

Controller

PS5012-E12C

Features	Specifications
Host Interface	<ul style="list-style-type: none"> • PCIe Gen 3x4 (Bandwidth: 8GT/s x4) • Compatible with PCIe Gen I(2.5Gbps), Gen II(5Gbps), Gen III(8Gbps) • Compliance with PCI Express Base Specification Revision 3.1 • Compliance with NVMe 1.3
Processor	<ul style="list-style-type: none"> • Dual-CPU architecture with built-in 32-bit microcontroller • TSMC 28nm process technology
Flash Controller	<ul style="list-style-type: none"> • Up to 4 Channels with 16 chips enable (CE) • Flash transfer rate up to 667MT/s • Capacity up to 2TB • Support 3D TLC and QLC NAND flash memory • Compliance with Toggle 3.0 and ONFi 4.0 • Flash I/O operating voltage supply 1.2V/1.8V
DRAM Controller	<ul style="list-style-type: none"> • DDR3L (16 bit, 1600Mbps) • DDR4 (8/16 bit, 1600Mbps)
Data Reliability	<ul style="list-style-type: none"> • Phison 3rd generation LDPC ECC & RAID ECC • DDR ECC engine • End-To-End Data Path Protection
Security	<ul style="list-style-type: none"> • AES 256 encryption engine • Pyrite • TCG OPAL 2.0
Performance	<ul style="list-style-type: none"> • Sequential Read up to 2000MB/s • Sequential Write up to 1600MB/s • 4K Random Read up to 420K IOPS • 4K Random Write up to 435K IOPS
Power Management	<ul style="list-style-type: none"> • L1.2 < 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"> • 324-ball TFBGA, 12 mm x 12 mm
Peripheral	<ul style="list-style-type: none"> • Built-in internal thermal sensor • GPIO pins • Built-in UART function • I2C and SPI for external ROM

Solutions

PS5012-E12C

Capacity ¹	128GB	256GB	512GB
Interface	PCIe Gen3x4 NVMe 1.3		
Form Factor	M.2 2280-S2		
NAND Flash	3D TLC		
Performance (Up to)^{2,3}			
Sequential Read	1800 MB/s	2000 MB/s	2000 MB/s
Sequential Write	600 MB/s	1200 MB/s	1600 MB/s
4K Random Read	105K MB/s	210K MB/s	390K MB/s
4K Random Write	150K MB/s	330K MB/s	430K MB/s
Power⁴			
Supply Voltage	M.2 3.3V ± 5%		
Active Read (Average)	3.3W	3.5W	3.5W
Active Write (Average)	2.3W	3.1W	3.5W
PS3	16mW	16mW	18mW
Low Power PS4 (L1.2)	2mW	2mW	2mW
Temperature			
Operating ⁵	0°C - 70°C		
Non-Operating	-40°C - 85°C		
Advanced Features	<ul style="list-style-type: none"> • End-to-End Data Protection • Pyrite/OPAL Support • Thermal Monitoring 		

¹ 1GB = 1,000,000,000 bytes

² 1MB/s = 1,000,000 bytes / second

³ Performance is based on Crystal Disk Mark 6.0.0 for sequential test and Iometer for random test

⁴ Measured power consumption during sequential read/write test on Crystal Disk Mark 6.0.0

⁵ Operational temperature is measured by device temperature sensor