



SM2270

High-performance PCIe NVMe SSD controller for data center applications

The SM2270 SSD controller enables high performance and high capacity SSD solutions with comprehensive SSD firmware. It offers a combination of high performance, high reliability, and flexible Open Channel SSD firmware which makes it ideal for use in data center applications.

The SM2270 features PCIe Gen3 x8 and 16 NAND Flash channels, and an NVMe management interface through the SMBus for out-of-band management, which is essential in datacenter applications.

The controller's three dual-core Arm® Cortex®-R5 CPUs provide guaranteed latency and outstanding performance of 4KB random read up to 800,000 IOPS, and 4KB random Write up to 200,000 IOPS.

The SM2270 ensures reliable operation and long lifespan of SSDs using the latest 3D NAND and QLC NAND Flash technology. Data integrity is safeguarded by end-to-end data path protection and Error Correction Code (ECC). Silicon Motion's 6th generation proprietary NANDXtend technology integrating error recovery with a machine learning algorithm prolongs data retention even when operating at high temperature. It also enhances data reliability throughout the SSD's lifespan for data integrity and QoS. Furthermore, Power Loss Protection can prevent data loss in the event of unexpected power outages.

The SM2270 thus provides a complete controller solution for SSDs which supports the latest technology from major NAND Flash manufacturers, provides flexible firmware design to meet the demanding requirements of data center applications, and offers reliable data storage over a long operating lifespan.

KEY FEATURES

- **High performance**
 - High and consistent random IOPS
 - Low latency with ensured QoS
- **Superior data integrity**
 - End-to-end data protection
 - ECC on DRAM and SRAM
- **Flexible implementation**
 - SDK-licensed solution or standard turnkey offering
 - Flexible/Customized firmware supports open channel SSD
- **Long SSD lifespan**
 - LDPC engine for superior error correction capability
 - Programmable RAID



SPECIFICATIONS

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Host interface	PCIe Gen3 x8
Command Protocol	NVMe 1.3
Processor	Triple ARM Cortex R5 Dual-core CPUs
Flash Controller	- 16CH/8CE for total 128CE - 3D TLC/QLC - Up to 16TB
DRAM Controller	- 32-bit data width - DDR3/3L/4-2133 and LPDDR3-1600 - Max addressing to 16GB with banking
Data Integrity and Reliability	- 2KB LDPC - Programmable RAID - E2E DPP (512B+2B-CRC) - DRAM ECC (SECEDED/32B+2B) - SRAM ECC (SECEDED/32b+7b)
Performance (U.2)	- Seq. Read: up to 3,200 MB/s - Seq. Write: up to 2,800 MB/s - 4KB Random Read: up to 800K IOPS - 4KB Random Write: up to 200K IOPS
Temperature	- 0 ~ 70C (Commercial) - -40 ~ 85C (Industrial)
Package	961-ball FCBGA (21mmx21mm)

BLOCK DIAGRAM

