SiliconMotion

SM2269XT

High Performance with low power
PCIe Gen4 x4 NVMe 1.4 SSD Controller

The SM2269XT, Silicon Motion's new-gen PCIe NVMe SSD controller, is ideally suited for small form factor, low power client SSDs – meeting the customer need of faster data access and higher throughput.

Superior Performance

By implementing the newer system architecture, Host Memory Buffer (HMB) function and Silicon Motion proprietary technologies, the SM2269XT controller is optimally designed for DRAM-less SSD applications. The PCIe Gen 4 interface provides single lane bandwidth of 16GT/s (total x4 lanes), coupled with four NAND flash channels of up to 1,600 MT/s data rate per channel. The SM2269XT SSD controller delivers performance up to 5.1GB/s and 4.8GB/s of sequential read/write and 900K/900K IOPS of random read/write.

High-Scale Reliability for 3D NAND

Benefited from the innovative 4K LDPC error-correction technologies, the SM2269XT enhances comprehensive data integrity and upgrades correction capability for the latest 3D TLC and QLC NAND without compromising throughput and latency. The built-in powerful RAID engine offers the flexibility for different RAID scheme based on the NAND Flash requirements. Thanks to the high efficiency, seamless cooperation between LDPC code, RAID engine, and firmware algorithms, the SM2269XT maximizes the NAND life span for SSD applications.

Intelligent Low-Power Scheme

The SM2269XT is fabricated on the advanced 12nm process, thereby contributing to lower power consumption, which just fits the needs for small form factor SSDs. The proprietary built-in smart clock gating mechanism can safely and automatically power down the area of unused blocks, achieving the most effective power consumption on the fly. Fully compliant with PC, PCIe and NVMe standards, the SM2269XT can operate in multiple power states based on host command requests and power consumption considerations. The controller's capability of managing power transitions between different power states are widely tested and verified in a variety of PC platforms.

KEY FEATURES

- **High Performance**
  - PCIe Gen4 x4
  - 4 NAND channels up to 1,600 MT/s
- **Best-in-class Low Power**
  - PS3 <15mW
  - PS4 (L1.2) <1.6mW
- **Data Integrity and Reliability**
  - HMB data with ECC protection
  - SRM ECC & CRC32 data path protection
- **NANDXtend® ECC Technology**
  - 4KB codeword LDPC
  - Embedded programmable RAID

SPECIFICATIONS

	SM2269XT
Host Interface	PCIe Gen4 x4
PCIe Protocol	NVMe 1.4
Processor	Dual-core ARM Cortex R8 CPU
NAND Flash Channel	4
Channel/CE	4CH/16CE
Max Performance	Sequential Read: 5.1GB/s Sequential Write: 4.8GB/s Random Read: 900K IOPS Random Write: 900K IOPS
NAND Flash Support	ONFI 4.2/3.0 and Toggle3.0/2.0 NV-DDR3 up to 1,600MT/s
Security	Real time full drive encryption with AES 128/256 TCG Opal 2.0 compliant Hardware SHA 256 and TRNG Secure Boot for FW authentication
Temperature Support	c-temp: 0°C to 70°C
Package	247-balls FCCSP (7.7mm x 11mm)