



SM2259

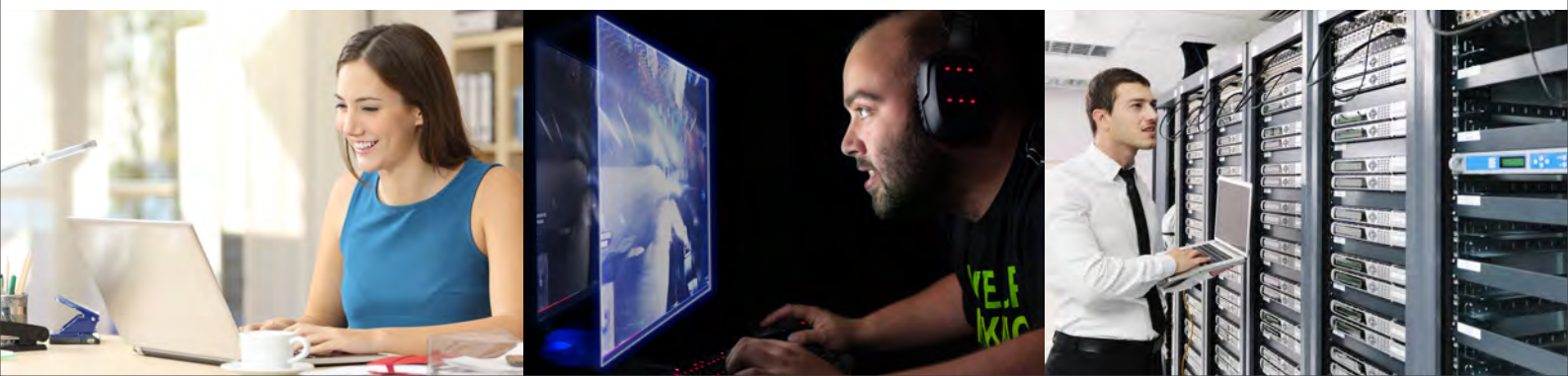
SATA 6Gb/s SSD Controller with NANDXtend™ Technology

The SM2259 is a high-performance SATA 6Gb/s SSD controller ideally suited for client SSDs. The SM2259 is a complete merchant ASIC/firmware solution supporting 3D NAND Flash from all major NAND suppliers. Leveraging Silicon Motion's proprietary NANDXtend™ error-correcting code (ECC) technology, the SM2259 provides a comprehensive data protection and enhances the endurance and retention of 3D NAND. Besides, SM2259 included the end-to-end data path protection capability to ensure the data integrity and reliability. SM2259 also features advanced Direct-to-TLC and SLC Caching algorithms for optimal sustained performance with TLC NAND.

KEY FEATURES

- **Ultra High Performance**
 - Sequential Read: 560 MB/s*
 - Sequential Write: 520 MB/s*
 - Random Read: 100k IOPS*
 - Random Write: 90k IOPS*
- **Optimal Sustained Performance**
 - Direct-to-TLC and SLC Caching
- **Comprehensive NAND Flash Support**
 - 3D NAND from all major NAND suppliers
- **Datapath Protection**
 - End to end data protection
 - SRAM ECC
- **Available in Commercial and Industrial Grade**

* with IMFT 3D TLC NAND



FEATURES

• Host Interface

- Supports SATA interface rate of 6Gb/s
- Compliant with Industrial Standard SATA Revision 3.1
- Compliant with Industrial Standard ATA/ATAPI-8 and ACS-3 command

• NANDXtend™ ECC Technology

- 1KB codeword LDPC
- Embedded programmable RAID

• NAND Flash Support

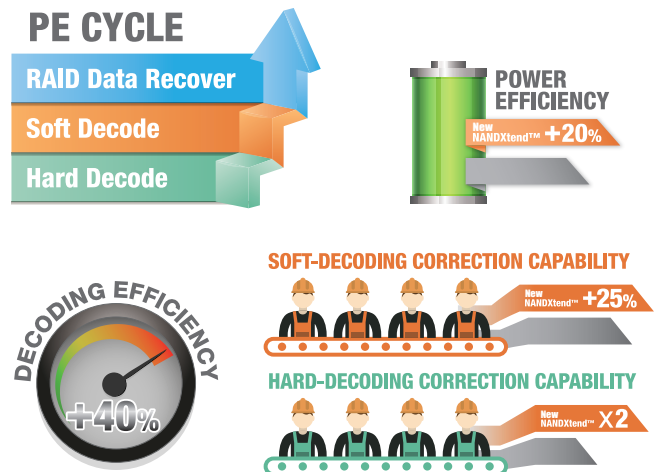
- Up to 4 NAND flash channels
- 8 chip enable pins per channel
- Supports ONFI 4.0 and Toggle 2.0 interface

• Enhanced Security

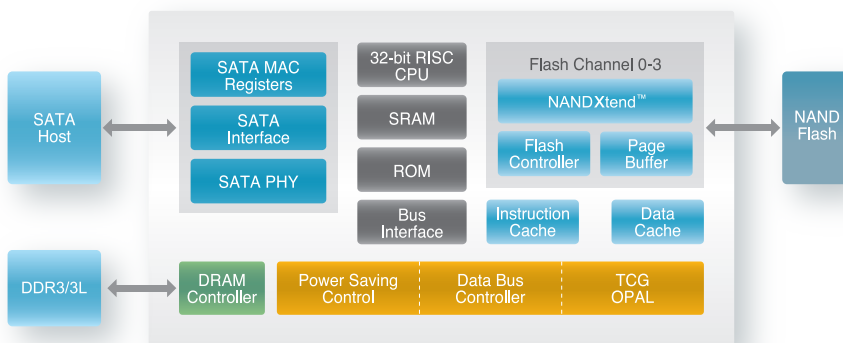
- Real time full drive encryption with AES
- Supports TCG Opal
- Hardware SHA 256 and TRNG

NANDXtend™ Technology

The SM2259 employs the company's proprietary NANDXtend™ ECC technology consisting of LDPC hard and soft decoding as well as RAID protection that together enhance the P/E cycles of 3D NAND - extending the SSD lifespan and ensuring data integrity. The new generation NANDXtend™ includes 2KB LDPC engine with advanced firmware algorithm delivers higher power efficiency, decoding efficiency and correction capability to maintain consistent data throughout and provide a better user experience, even as error bits increase throughout the product lifecycle of NAND Flash.



BLOCK DIAGRAM



SPECIFICATIONS

Host Standards	SATA 6Gb/s
ATA Protocol	ATA-8
Flash I/F	4 Channel
CE/Channel	8
Commercial Temperature	0°C to 70°C
Industrial Temperature	-40°C to 85°C
Package	336-ball TFBGA