KIOXIA

Product Brief

SLC NAND

A 1-bit per cell, non-volatile memory, KIOXIA's SLC NAND writes large amounts of data at high speed; provides high write/erase cycle endurance; offers support for a wide range of operating temperatures and provides excellent reliability. Its high endurance makes it ideally suited for a variety of consumer and industrial applications where reliability and longevity of supply is important.

Noted for its high performance, reliability, compact form factor, low power consumption, and ability to work over an extended temperature range, single-level cell (SLC) NAND is a cornerstone NAND flash technology. It offers an excellent balance between cost and performance to store boot and small-to-medium OS code for many applications, including IoT, automotive and emerging embedded applications.

Advantages

- High read/write performance
- High reliability and endurance
- Low power consumption
- Small package options
- Extended temperature range
- Cost-effective solution with low density options

Key Features

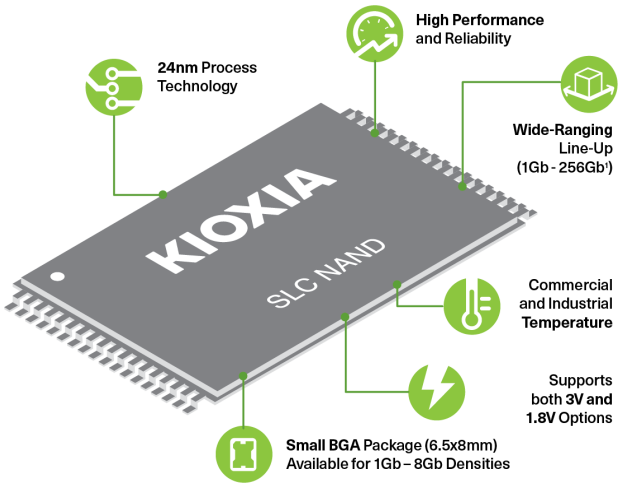
- 24nm process technology
- Wide density range
- Commercial & industrial temperatures
- 3V and 1.8V options
- Broad package line-up: 63 BGA,
- 67 BGA, TSOP, 132 BGA

Applications

- Digital TVs
- Set-top-boxes
- Printers
- Digital cameras
- DVD and Blu-Ray
- Players
- Toys/Games
- Robots
- Smart Meters
- M2M Modules
- GPON Modules
- IoT
- Surveillance
- Cameras
- Wearables
- Medical

Densities

- 1Gb
- 2Gb
- 4Gb
- 8Gb
- 16Gb
- 32Gb
- 64Gb
- 128Gb
- 256Gb



Why KIOXIA SLC NAND?

KIOXIA's SLC NAND memory products provide best-in-class endurance and reliability and are available in a range of densities and multiple package options to meet the diverse requirements of the embedded market. From raw SLC NAND to Serial Interface NAND to BENAND™, designers can choose an SLC NAND device based on the error correction capability and memory interface of the host controller used in their application.

Invented by KIOXIA in 1987, SLC NAND is the original NAND architecture. Today, KIOXIA is one of the world's largest suppliers of SLC NAND and remains committed to support multiple SLC NAND generations to accommodate applications that have long product life cycles. In fact, we have an entire fab dedicated to support the production of SLC NAND.

SLC NAND | Raw NAND

Part Number (24nm)	Capacity (bit)	VCC (V)	Page Size (bit)	Block Size (bit)	Operating Temp (°C)	Package	Number of Pins
TC58NVG0S3HTA00	1G	2.70 to 3.60	(2048+128)x8	(128K+8K)x8	0 to 70	TSOP	48
TC58NVG0S3HBAI4	1G	2.70 to 3.60	(2048+128)x8	(128K+8K)x8	-40 to 85	FBGA	63
TC58NVG0S3HBAI6	1G	2.70 to 3.60	(2048+128)x8	(128K+8K)x8	-40 to 85	FBGA	67
TC58NVG0S3HTAI0	1G	2.70 to 3.60	(2048+128)x8	(128K+8K)x8	-40 to 85	TSOP	48
TC58NYG0S3HBAI4	1G	1.70 to 1.95	(2048+128)x8	(128K+8K)x8	-40 to 85	FBGA	63
TC58NYG0S3HBAI6	1G	1.70 to 1.95	(2048+128)x8	(128K+8K)x8	-40 to 85	FBGA	67
TC58NVG1S3HTA00	2G	2.70 to 3.60	(2048+128)x8	(128K+8K)x8	0 to 70	TSOP	48
TC58NVG1S3HBAI4	2G	2.70 to 3.60	(2048+128)x8	(128K+8K)x8	-40 to 85	FBGA	63
TC58NVG1S3HBAI6	2G	2.70 to 3.60	(2048+128)x8	(128K+8K)x8	-40 to 85	FBGA	67
TC58NVG1S3HTAI0	2G	2.70 to 3.60	(2048+128)x8	(128K+8K)x8	-40 to 85	TSOP	48
TC58NYG1S3HBAI4	2G	1.70 to 1.95	(2048+128)x8	(128K+8K)x8	-40 to 85	FBGA	63
TC58NYG1S3HBAI6	2G	1.70 to 1.95	(2048+128)x8	(128K+8K)x8	-40 to 85	FBGA	67
TC58NVG2S0HTA00	4G	2.70 to 3.60	(4096+256)x8	(256K+16K)x8	0 to 70	TSOP	48
TC58NVG2S0HBAI4	4G	2.70 to 3.60	(4096+256)x8	(256K+16K)x8	-40 to 85	FBGA	63
TC58NVG2S0HBAI6	4G	2.70 to 3.60	(4096+256)x8	(256K+16K)x8	-40 to 85	FBGA	67
TC58NVG2S0HTAI0	4G	2.70 to 3.60	(4096+256)x8	(256K+16K)x8	-40 to 85	TSOP	48
TC58NYG2S0HBAI4	4G	1.70 to 1.95	(4096+256)x8	(256K+16K)x8	-40 to 85	FBGA	63
TC58NYG2S0HBAI6	4G	1.70 to 1.95	(4096+256)x8	(256K+16K)x8	-40 to 85	FBGA	67
TH58NVG2S3HTA00	4G (2Gx2)	2.70 to 3.60	(2048+128)x8	(256K+16K)x8	0 to 70	TSOP	48
TH58NVG2S3HTAI0	4G (2G x2)	2.70 to 3.60	(2048+128)x8	(128K+8K)x8	-40 to 85	TSOP	48
TH58NVG2S3HBAI6	4G (2Gx2)	2.70 to 3.60	(2048+128)x8	(128K+8K)x8	-40 to 85	FBGA	67
TH58NVG2S3HBAI4	4G (2Gx2)	2.70 to 3.60	(2048+128)x8	(128K+8K)x8	-40 to 85	FBGA	63
TH58NVG3S0HTA00	8G (4Gx2)	2.70 to 3.60	(4096+256)x8	(256K+16K)x8	0 to 70	TSOP	48
TH58NVG3S0HBAI6	8G (4Gx2)	2.70 to 3.60	(4096+256)x8	(256K+16K)x8	-40 to 85	FBGA	67
TH58NVG3S0HTAI0	8G (4Gx2)	2.70 to 3.60	(4096+256)x8	(256K+16K)x8	-40 to 85	TSOP	48
TH58NVG4S0HTA20	16G (4Gx4)	2.70 to 3.60	(4096+256)x8	(256K+16K)x8	0 to 70	TSOP	48
TH58NVG4S0HTAK0	16G (4G x4)	2.70 to 3.60	(4096+256)x8	(256K+16K)x8	-40 to 85	TSOP	48

* For 32nm and 43nm product information, please contact KIOXIA.

Product image may differ from the actual product.

Read and write speed may vary depending on the host device, read and write conditions, and file size.

Product density is identified based on the density of memory chip(s) within the Product, not the amount of memory capacity available for data storage by the end user. Consumer-usable capacity will be less due to overhead data areas, formatting, bad blocks, and other constraints, and may also vary based on the host device and application. For details, please refer to applicable product specifications. The definition of 1GB = 2^{30} bytes = 1,073,741,824 bytes

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Serial Interface NAND

KIOXIA's Serial NAND is single-level cell (SLC) NAND, a 1-bit per cell, non-volatile memory device with a serial peripheral interface (SPI) that is similar to NOR Flash. As such, Serial NAND can be used with the same hardware interface as NOR Flash. NOR flash memory has commonly been used in consumer and industrial devices but, new, enhanced features found in today's embedded devices require larger memory densities. Additionally, many microcontroller manufacturers are moving away from the high-pin-count parallel address/data bus in favor of lower-pin-count interfaces.

KIOXIA's Serial NAND lineup provides an excellent NOR flash alternative, giving users a higher density, more cost-effective solution. With only 6 active pins and a small WSON package, Serial NAND simplifies board layout and is ideal for applications in small form factors.

Advantages

- Standardized high speed (SPI) interface
- Hardware compatible with SPI NOR
- Lower bit cost than NOR flash
- Host can control the device with a low pin count interface
- Long data retention and high-performance write/erase capability

Key Features

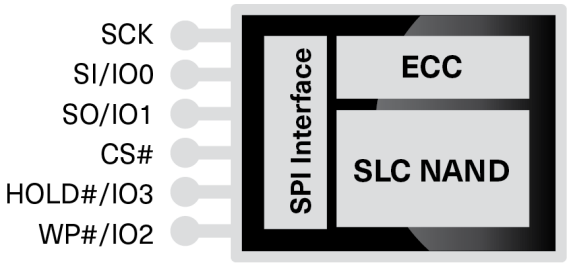
- Quad SPI Program /Read Mode capable
- Embedded ECC function (on/off bit flip report)
- Program / Read x4 mode
- 3V and 1.8V options
- Spacing saving 6x8mm WSON package
- Operating temperature range: -40 °C to 85 °C

Applications

- Digital TVs
- Set-top-boxes
- Printers
- Digital Cameras
- DVD and Blu-Ray
- Players
- Toys/Games
- Robots
- Smart Meters
- IoT Devices
- GPON
- Modules
- M2M
- Modules
- Surveillance
- Cameras
- Wearables
- Medical

Densities

- 128GB
- 256GB
- 512GB
- 1,024GB



Low Pin Count Serial Interface NAND

Why KIOXIA Serial Interface NAND?

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Serial Interface NAND

Part Number (24nm – 2nd Gen)	Capacity (bit)	VCC (V)	Page Size (bit)	Block Size (bit)	Operating Temp (°C)	Package	Number of Pins
TC58CVG0S3HRAIJ	1G	2.70 to 3.60	(2048+64)x8	(128K+4K)x8	-40 to 85	WSON8	8
TC58CYG0S3HRAIJ	1G	1.70 to 1.95	(2048+64)x8	(128K+4K)x8	-40 to 85	WSON8	8
TC58CVG1S3HRAIJ	2G	2.70 to 3.60	(2048+64)x8	(128K+4K)x8	-40 to 85	WSON8	8
TC58CYG1S3HRAIJ	2G	1.70 to 1.95	(2048+64)x8	(128K+4K)x8	-40 to 85	WSON8	8
TC58CVG2S0HRAIJ	4G	2.70 to 3.60	(4096+128)x8	(256K+8K)x8	-40 to 85	WSON8	8
TC58CYG2S0HRAIJ	4G	1.70 to 1.95	(4096+128)x8	(256K+8K)x8	-40 to 85	WSON8	8
TH58CVG3S0HRAIJ	8G	2.70 to 3.60	(4096+128)x8	(256K+8K)x8	-40 to 85	WSON8	8
TH58CYG3S0HRAIJ	8G	1.70 to 1.95	(4096+128)x8	(256K+8K)x8	-40 to 85	WSON8	8

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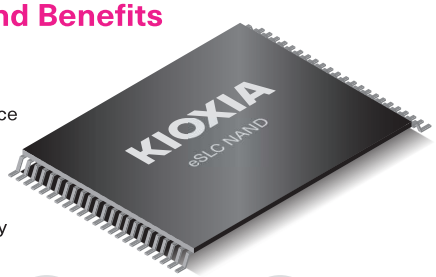
KIOXIA Enterprise SLC

High Density, High Endurance

KIOXIA Enterprise SLC (eSLC) devices offer high density, high endurance, and high reliability for a variety of applications. When boot code with high reliability is a must, eSLC is a cost-effective, flexible solution.

Features and Benefits

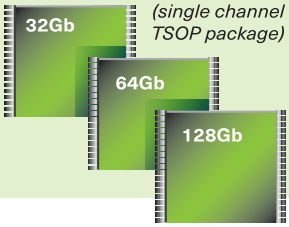
- High Endurance
- High Reliability
- High Density
- I Temp and C Temp Options
- Legacy and Toggle Mode Interfaces
- TSOP / BGA Packages



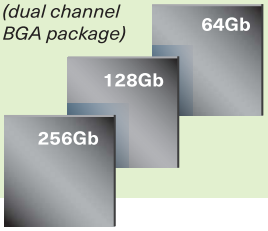
eSLC Densities and Packaging

High Density SLC Flash Memory with I Temp and C Temp Options

Legacy Interface eSLC *(single channel TSOP package)*



Toggle Mode Interface eSLC *(dual channel BGA package)*



eSLC Target Applications

For applications requiring a memory solution that can withstand excessive temperatures or a rugged environment, eSLC is an ideal solution*:

- Industrial SSD Modules
- eUSB
- eSD
- RAID Cards
- Wireless Infrastructure
- Factory Automation
- IIoT
- Electrical Utility Infrastructure
- Network Interface Cards

The KIOXIA SLC Family

SLC | BENAND™ | Serial NAND | **eSLC NAND**

KIOXIA

KIOXIA delivers flash-based products for next-generation storage applications. Having invented NAND flash over 35 years ago, KIOXIA is now one of the world's largest flash memory suppliers – and continues to move the technology forward.

*Tolerances for temperature ranges and environmental conditions vary, please refer to individual product specifications for details.

In every mention of a KIOXIA product: Product density is identified based on the density of memory chip(s) within the Product, not the amount of memory capacity available for data storage by the end user. Consumer-usable capacity will be less due to overhead data areas, formatting, bad blocks, and other constraints, and may also vary based on the host device and application. For details, please refer to applicable product specifications. The definition of 1KB = 2^{10} bytes = 1,024 bytes. The definition of 1Gb = 2^{30} bits = 1,073,741,824 bits. The definition of 1GB = 2^{30} bytes = 1,073,741,824 bytes. 1Tb = 2^{40} bits = 1,099,511,627,776 bits.

V1.0