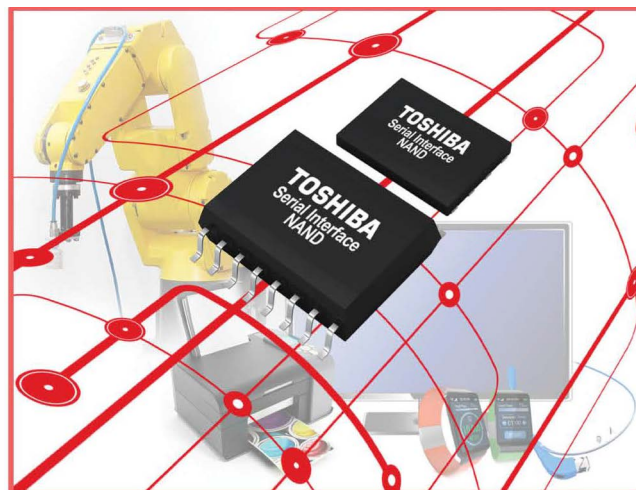


## > SERIAL NAND SLC NAND with SPI Interface

Toshiba's SLC NAND advanced flash memory products provide cutting-edge endurance and data retention for sensitive or frequently-used data. For long-lasting products or systems working with extremely high data throughput between the host and the memory, Toshiba's SLC is an ideal solution.

Toshiba's new lineup of 24nm-based Serial NAND flash memory products are compatible with the widely used Serial Peripheral Interface (SPI), giving users access to an SLC NAND flash memory with a low pin count, small package size and large capacity.

## NAND FLASH MEMORY



### > APPLICATIONS

- Industrial Applications
- Consumer Electronics
- Multimedia Applications
- Smart Metering & Intelligent Lighting



### > FEATURES

- Cost-efficient 24nm SLC
- 1Gbit, 2Gbit and 4Gbit
- Compatible with SPI Standard
- Extended temperature range
- SOP and WSON packages
- On-chip hardware ECC which can be turned off/on
- Unique bit flip report function
- Data protection feature
- High-speed sequential read mode

### > ADVANTAGES

- Broad lineup to meet customer demand for different densities
- 24nm technology for cost optimization
- Long data retention or extreme write/erase performance
- Small package for reduced board space
- Standardized high speed serial interface (SPI)
- No ECC operation required on the host side
- Produced in Toshiba's cutting-edge technology flash factory

### > BENEFITS

- An ideal solution for long-lasting storage of significant data or very frequently changed data
- Reduced BOM cost due to latest 24nm production technology
- Supports smaller board size e.g. for mobile devices
- Host can control the device by using a maximum of 6 active pins
- Cost and performance optimized as host does not have to include ECC function for memory management
- Hosts which support SPI interface can now utilize SLC NAND

### > SPECIFICATIONS

Features	Serial NAND
Density	1Gbit, 2Gbit & 4Gbit
Technology	24nm SLC
Interface	Serial Peripheral Interface (SPI)
ECC (Error Correction Code)	Embedded on Memory Chip
Temperature	-40°C to 85°C
Package	16 pin SOP and 8 pin WSON (BGA under development)

## > SERIAL NAND – PRODUCT LIST

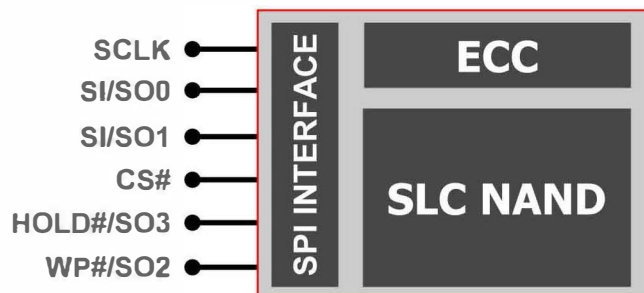
Part Number	Density	Page Size	Voltage	Temperature	Package
TC58CVG0S3HRAIG	1Gbit	(2048+64)x8 bit	3.3V	-40°C to 85°C	WSON8
TC58CVG0S3HQAIE					SOP16
TC58CYG0S3HRAIG			1.8V		WSON8
TC58CYG0S3HQAIE					SOP16
TC58CVG1S3HRAIG	2Gbit	(2048+64)x8 bit	3.3V	-40°C to 85°C	WSON8
TC58CVG1S3HQAIE					SOP16
TC58CYG1S3HRAIG			1.8V		WSON8
TC58CYG1S3HQAIE					SOP16
TC58CVG2S0HRAIG	4Gbit	(4096+128)x8 bit	3.3V	-40°C to 85°C	WSON8
TC58CVG2S0HQAIE					SOP16
TC58CYG2S0HRAIG			1.8V		WSON8
TC58CYG2S0HQAIE					SOP16

All Serial NAND Memory uses Toshiba's 24nm technology and features internal ECC.

## > ENHANCED FEATURES

<b>Embedded ECC</b>	Serial NAND has an integrated 8Bit ECC, which can be turned off on demand
<b>Bit Flip Management</b>	The Serial NAND offers a bit flip count report, where internal ECC H/W reports detail the bit flip count of each sector. This function allows designers to develop a more reliable system with a reduced number of errors.
<b>Block Protection</b>	Developers can protect the last 128 blocks, and the protection is a permanent setting. Program and erase operations to the protected block are ignored, allowing the designer to realize a more secure system.
<b>Serial Peripheral Interphase (SPI)</b>	SPI (x1, x2, x4) Clock Frequency: up to 104MHz
<b>High Speed Sequential Read Mode</b>	The sequential read mode allows developers to quickly read data, even while using a normal read command sequence. There is no need to modify the software to utilize this function.

## > SERIAL NAND – SLC WITH ECC AND SPI INTERFACE



Product density is identified based on the maximum 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.

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