

# Serial Interface NAND – An Excellent NOR Flash Alternative

NOR flash memory has been commonly used in consumer and industrial devices. But, new, enhanced features in IoT and communications applications are driving the need for higher density flash memory.

## Replacing SPI NOR with Serial NAND

KIOXIA's Serial NAND is SLC NAND with a serial peripheral interface (SPI). SPI is an industry standard inter-chip interface that is used in NOR flash and supported by most microprocessors and microcontrollers.



- Cost advantage** over SPI NOR
- Faster programming** speed than NOR

24nm Process Technology



Embedded ECC engine



Small BGA Package Option Available (6.5 x 8 mm)



### Benefits of Serial NAND

Operation temp: -40°C to 85°C



Quad SPI Program / Read Mode capable



Low pin count interface



1.8V and 3.3V options

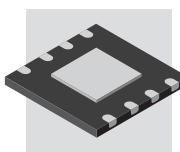


High-speed read mode<sup>1</sup>

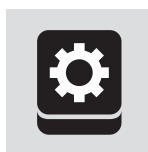
## Design Considerations



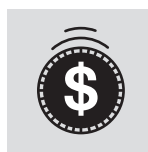
Host microprocessor with SPI interface



Serial NAND is H/W pin compatible with SPI NOR



NOR and Serial NAND use different software drivers



NAND offers lower cost per bit

## Applications



Smart Speakers



Wearables



Flat Screen TVs



Printers



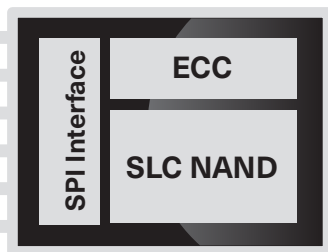
Robots



Medical Monitoring Equipment

## Low Pin Count Interface

SLCK  
SI/SO0  
SO/SO1  
CS#  
HOLD#/SO3  
WP#/SO2



## Densities<sup>2</sup>

1Gb 2Gb 4Gb 8Gb

## KIOXIA

KIOXIA delivers flash-based products for next-generation storage applications. Having invented NAND flash over 30 years ago, KIOXIA is now one of the world's largest flash memory suppliers – and continues to move the technology forward.

[1] Read and write speed may vary depending on the host device, read and write conditions, and file size.  
[2] 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<sup>10</sup> bytes = 1,024 bytes. The definition of 1Gb = 2<sup>30</sup> bits = 1,073,741,824 bits. The definition of 1GB = 2<sup>30</sup> bytes = 1,073,741,824 bytes. 1Tb = 2<sup>40</sup> bits = 1,099,511,627,776 bits.