



Chipsmall Limited consists of a professional team with an average of over 10 year of expertise in the distribution of electronic components. Based in Hongkong, we have already established firm and mutual-benefit business relationships with customers from,Europe,America and south Asia,supplying obsolete and hard-to-find components to meet their specific needs.

With the principle of “Quality Parts,Customers Priority,Honest Operation,and Considerate Service”,our business mainly focus on the distribution of electronic components. Line cards we deal with include Microchip,ALPS,ROHM,Xilinx,Pulse,ON,Everlight and Freescale. Main products comprise IC,Modules,Potentiometer,IC Socket,Relay,Connector.Our parts cover such applications as commercial,industrial, and automotives areas.

We are looking forward to setting up business relationship with you and hope to provide you with the best service and solution. Let us make a better world for our industry!



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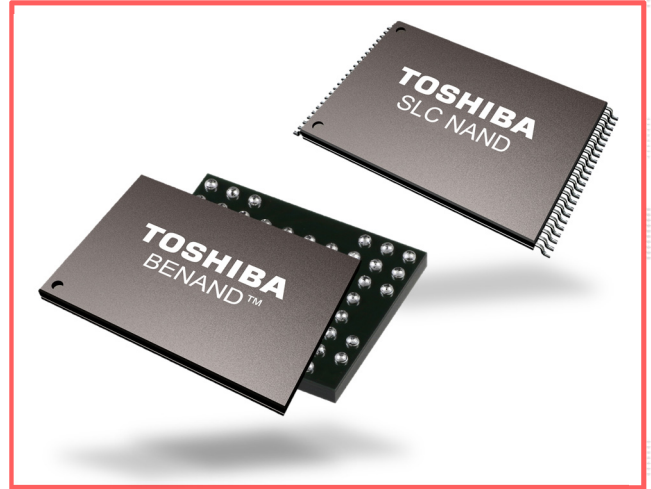
NAND FLASH MEMORY

> SLC NAND & BENAND™

Reliability and Performance

Toshiba's advanced Flash Memory technology offers SLC NAND providing best in class endurance and data retention for sensitive or frequently used data in a system. For long lasting products or systems working with extremely high data throughput between the host and the memory, Toshiba SLC is the optimal solution.

Toshiba's new BENAND™ removes the burden of error correction code (ECC) from the host processor by offering ECC embedded in the hardware while keeping the same specification, high reliability and performance as a raw SLC.



> APPLICATIONS

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



> FEATURES

- **SLC NAND 24nm**
 - 1Gbit – 128Gbit
 - Extended temperature range
 - TSOP and BGA package
- **BENAND™ 24nm**
 - **Built in ECC SLC NAND**
 - 1Gbit – 8Gbit
 - On chip H/W ECC
 - Same reliability and performance as to raw SLC
 - Same Hardware interface and package as raw SLC

> ADVANTAGES

- Broad line up to cover customers demand for different densities
- Leading edge 24nm Technology for cost optimization
- Long data retention or extreme write/erase performance
- Small package variation for reduced board space
- With BENAND™ no ECC operation is required on the host side
- Produced in the world's largest, leading edge technology flash factory

> BENEFITS

- Optimal storage 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
- Using **Toshiba BENAND™** it is possible to utilize the latest 24nm SLC NAND flash technology even if the existing platform cannot support higher bit ECC. **No hardware or software change necessary.**

> SPECIFICATIONS

Product / Features	SLC NAND	BENAND™ (SLC+ECC)
Density	1Gbit – 128Gbit	1Gbit – 8Gbit
Technology	24nm	
ECC (Error Correction Code)	Required on Host Side	Embedded on Memory Chip
Temperature	-40°C to 85°C 0°C to 70°C	
Package	TSOP and BGA	

> SLC NAND - PRODUCT LIST

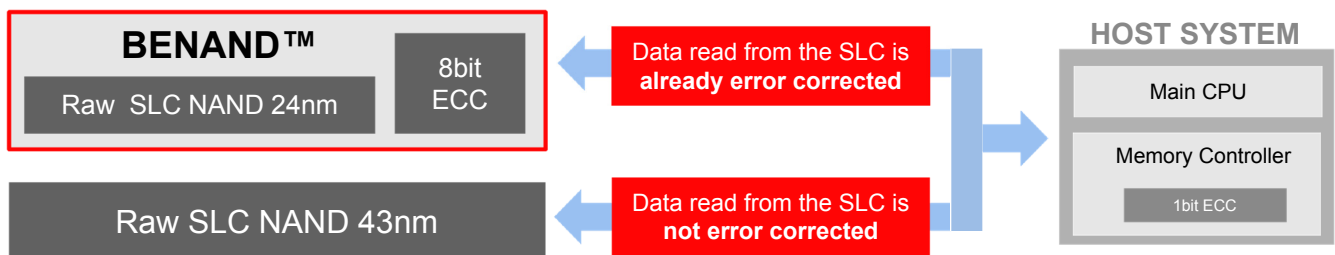
Density	Part Number	Techn.	Page Size	Vcc	ECC	Temperature	Package
1Gbit	TC58NVG0S3HTA00	24nm	(2048+128)x8 bit	3.3V	8bit/512B	0°C to 70°C	48TSOP 12x20
	TC58NYG0S3HBAI4	24nm	(2048+128)x8 bit	1.8V	8bit/512B	-40°C to 85°C	63BGA 9x11
	TC58NVG0S3HTAI0	24nm	(2048+128)x8 bit	3.3V	8bit/512B	-40°C to 85°C	48TSOP 12x20
	TC58NVG0S3HBAI4	24nm	(2048+128)x8 bit	3.3V	8bit/512B	-40°C to 85°C	63BGA 9x11
2Gbit	TC58NVG1S3HTA00	24nm	(2048+128)x8 bit	3.3V	8bit/512B	0°C to 70°C	48TSOP 12x20
	TC58NYG1S3HBAI4	24nm	(2048+128)x8 bit	1.8V	8bit/512B	-40°C to 85°C	63BGA 9x11
	TC58NVG1S3HTAI0	24nm	(2048+128)x8 bit	3.3V	8bit/512B	-40°C to 85°C	48TSOP 12x20
	TC58NVG1S3HBAI4	24nm	(2048+128)x8 bit	3.3V	8bit/512B	-40°C to 85°C	63BGA 9x11
4Gbit	TH58NVG2S3HTA00	24nm	(2048+128)x8 bit	3.3V	8bit/512B	0°C to 70°C	48TSOP 12x20
	TC58NVG2S0HTA00	24nm	(4096+256)x8 bit	3.3V	8bit/512B	0°C to 70°C	48TSOP 12x20
	TC58NVG2S0HTAI0	24nm	(4096+256)x8 bit	3.3V	8bit/512B	-40°C to 85°C	48TSOP 12x20
	TH58NVG2S3HTAI0	24nm	(2048+128)x8 bit	3.3V	8bit/512B	-40°C to 85°C	48TSOP 12x20
	TH58NVG2S3HBAI4	24nm	(2048+128)x8 bit	3.3V	8bit/512B	-40°C to 85°C	63BGA 9x11
	TH58NYG2S3HBAI4	24nm	(2048+128)x8 bit	1.8V	8bit/512B	-40°C to 85°C	63BGA 9x11
	TC58NVG2S0HBAI4	24nm	(4096+256)x8 bit	3.3V	8bit/512B	-40°C to 85°C	63BGA 9x11
	TC58NYG2S0HBAI4	24nm	(4096+256)x8 bit	1.8V	8bit/512B	-40°C to 85°C	63BGA 9x11
8Gbit	TH58NVG3S0HTA00	24nm	(4096+256)x8 bit	3.3V	8bit/512B	0°C to 70°C	48TSOP 12x20
	TH58NVG3S0HBAI4	24nm	(4096+256)x8 bit	3.3V	8bit/512B	-40°C to 85°C	63BGA 9x11
	TH58NYG3S0HBAI4	24nm	(4096+256)x8 bit	1.8V	8bit/512B	-40°C to 85°C	63BGA 9x11
	TH58NVG3S0HTAI0	24nm	(4096+256)x8 bit	3.3V	8bit/512B	-40°C to 85°C	48TSOP 12x20
16Gbit	TH58NVG4S0FTA20	32nm	(4096+232)x8 bit	3.3V	4bit/512B	0°C to 70°C	48TSOP 12x20
	TH58NYG4S0FBAID	32nm	(4096+232)x8 bit	1.8V	4bit/512B	-40°C to 85°C	63BGA 10x11
	TH58NVG4S0FTAK0	32nm	(4096+232)x8 bit	3.3V	4bit/512B	-40°C to 85°C	48TSOP 12x20
	TH58NVG4S0FBAID	32nm	(4096+232)x8 bit	3.3V	4bit/512B	-40°C to 85°C	63BGA 10x11
32Gbit	TH58NVG5S0FTA20	32nm	(4096+232)x8 bit	3.3V	4bit/512B	0°C to 70°C	48TSOP 12x20
	TH58NVG5S0FTAK0	32nm	(4096+232)x8 bit	3.3V	4bit/512B	-40°C to 85°C	48TSOP 12x20
64Gbit	TH58NVG6H2HTAK0	24nm	(8192+1024)x8 bit	3.3V	24bit/1024B	-40°C to 85°C	48TSOP 12x20
128Gbit	TH58NVG7H2HTA20	24nm	(8192+1024)x8 bit	3.3V	24bit/1024B	0°C to 70°C	48TSOP 12x20

> BENAND™ - PRODUCT LIST

Density	Part Number	Techn.	Page Size	Vcc	ECC	Temperature	Package
1Gbit	TC58BVG0S3HTA00	24nm	(2048+64)x8 bit	3.3V	internal ECC	0°C to 70°C	48TSOP 12x20
	TC58BYG0S3HBAI4	24nm	(2048+64)x8 bit	1.8V	internal ECC	-40°C to 85°C	63BGA 9x11
	TC58BVG0S3HTAI0	24nm	(2048+64)x8 bit	3.3V	internal ECC	-40°C to 85°C	48TSOP 12x20
	TC58BVG0S3HBAI4	24nm	(2048+64)x8 bit	3.3V	internal ECC	-40°C to 85°C	63BGA 9x11
2Gbit	TC58BVG1S3HTA00	24nm	(2048+64)x8 bit	3.3V	internal ECC	0°C to 70°C	48TSOP 12x20
	TC58BYG1S3HBAI4	24nm	(2048+64)x8 bit	1.8V	internal ECC	-40°C to 85°C	63BGA 9x11
	TC58BVG1S3HTAI0	24nm	(2048+64)x8 bit	3.3V	internal ECC	-40°C to 85°C	48TSOP 12x20
	TC58BVG1S3HBAI4	24nm	(2048+64)x8 bit	3.3V	internal ECC	-40°C to 85°C	63BGA 9x11
4Gbit	TH58BVG2S3HTA00	24nm	(2048+64)x8 bit	3.3V	internal ECC	0°C to 70°C	48TSOP 12x20
	TC58BVG2S0HTA00	24nm	(4096+128)x 8 bit	3.3V	internal ECC	0°C to 70°C	48TSOP 12x20
	TH58BYG2S3HBAI4	24nm	(2048+64)x8 bit	1.8V	internal ECC	-40°C to 85°C	63BGA 9x11
	TC58BYG2S0HBAI4	24nm	(4096+128)x 8 bit	1.8V	internal ECC	-40°C to 85°C	63BGA 9x11
	TH58BVG2S3HTAI0	24nm	(2048+64)x8 bit	3.3V	internal ECC	-40°C to 85°C	48TSOP 12x20
	TC58BVG2S0HTAI0	24nm	(4096+128) x 8 bit	3.3V	internal ECC	-40°C to 85°C	48TSOP 12x20
8Gbit	TH58BVG3S0HTA00	24nm	(4096+128)x 8 bit	3.3V	internal ECC	0°C to 70°C	48TSOP 12x20
	TH58BYG3S0HBAI4	24nm	(4096+128)x 8 bit	1.8V	internal ECC	-40°C to 85°C	63BGA 9x11
	TH58BVG3S0HTAI0	24nm	(4096+128)x 8 bit	3.3V	internal ECC	-40°C to 85°C	48TSOP 12x20
	TH58BVG3S0HBAI4	24nm	(4096+128)x 8 bit	3.3V	internal ECC	-40°C to 85°C	63BGA 9x11

*Valid Q22014

> BENAND™ - SLC WITH EMBEDDED ECC FOR BOM REDUCTION AND SYSTEM FLEXIBILITY



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