

SuperFlash® Memory Products

High Performance, Low Power Consumption and Superior Reliability

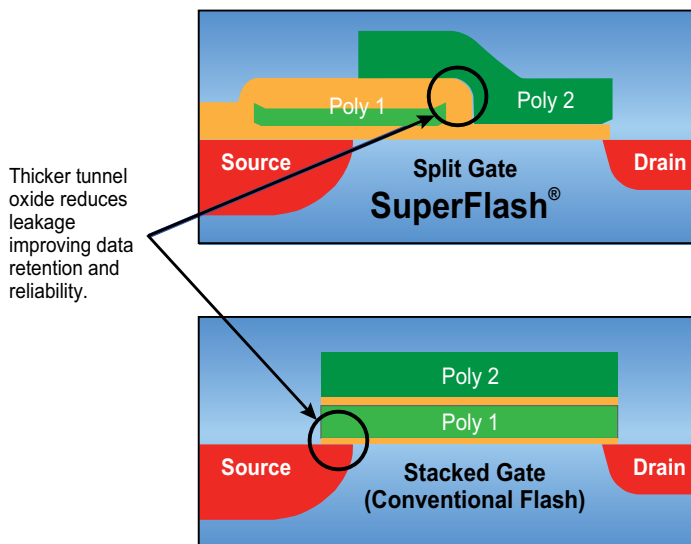
What is SuperFlash?

SuperFlash is an innovative, highly reliable and versatile type of NOR Flash memory invented by Silicon Storage Technology (SST). SuperFlash memory is much more flexible and reliable than competing non-volatile memories. This technology utilizes a split-gate cell architecture which uses a robust thick-oxide process that requires fewer mask steps resulting in a lower-cost nonvolatile memory solution with excellent data retention and higher reliability.

SuperFlash Advantages

- Fast, fixed program and erase times
 - ~ 40 ms vs. more than a minute for 64 Mb
 - Results in improved manufacturing efficiency and lower costs
- No pre-programming or verify required prior to erase
 - Results in significantly lower power consumption
- Superior reliability
 - 100K cycles and 100 years data retention
- Inherent small sector size
 - 4 KB erase sector vs. 64 KB
 - Results in faster re-write operations and contributes to lowering overall power consumption

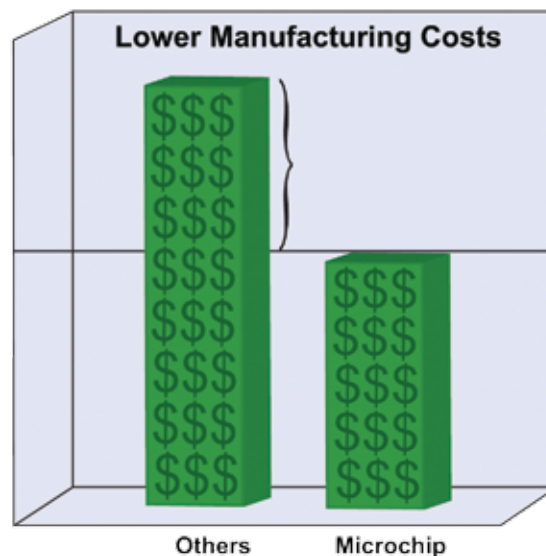
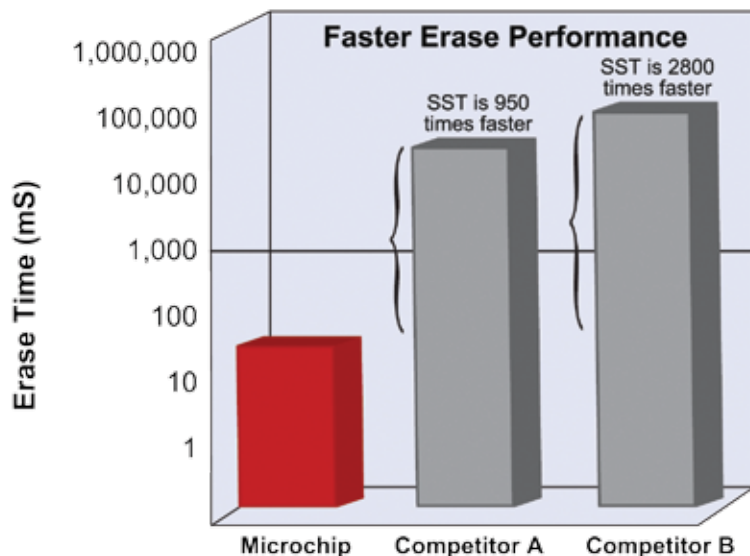
Memory Cell Structure Comparison



Time Is Money

Fast erase performance improves manufacturing efficiency and lowers product costs!

With stacked gate flash, extensive production testing can slow down the manufacturing flow, costing more money. SuperFlash can lower test and/or programming costs by as much as \$0.32 per unit*.



* Based on 64 seconds × US \$0.005 per second = US \$0.32 per unit. 64 seconds is the typical chip erase time for our competitors' 64 Mb device. Our 64 Mb device maximum chip erase time is 50 ms.



MICROCHIP

Fast Erase Performance Improves Manufacturing Efficiency and Lower Costs!

Parameter	SST38VF640X 64 Mb		Competitor A 64 Mb		Competitor B 64 Mb	
	Typ	Max	Typ	Max	Typ	Max
Read	–	90 ns	–	90 ns	–	90 ns
Page Read (Word in page after initial access)	–	25 ns	–	25 ns	–	25 ns
Program	7 μ s	10 μ s	60 μ s	–	50 μ s	–
Write Buffer Programming	28 μ s	40 μ s	240 μ s (200 μ s)*	–	240 μ s (200 μ s)*	–
Erase: Sector (4 KWord)	18 ms	25 ms	N/A	N/A	N/A	N/A
Erase: Block (32 KWord)	18 ms	25 ms	0.5 sec	3.5 sec	0.5 sec	–
Erase: Full Chip	40 ms	50 ms	64 sec	128 sec	64 sec	128 sec

* Must use external 12V supply to achieve numbers inside ().

Multi-Purpose Flash Plus (MPF+)

- Industry-standard program, erase, read flash memory
- Flash densities: 4 Mb to 64 Mb
- Operating voltage: 2.7V to 3.6V
- Temperature Range: –40° C to 85° C
- JEDEC standard pin-outs
 - 48-lead TSOP
 - 48-ball TFBGA
 - 48-ball WFBGA
- Hardware Reset Pin (RST#)
- Boot block with WP# input pin
- Erase suspend/resume
- Security ID
 - 128 bits factory-programmed + 128 words user programmed

Product Family	Density (Mbits)	Memory Organization	Read Access Speed	Boot Sector	Packages
SST39VF401C	4	256K $\times$ 16	70 ns	Bottom	48/TSOP, 48/TFBGA, 48/WFBGA, 48/XFLGA
SST39VF402C	4	256K $\times$ 16	70 ns	Top	48/TSOP, 48/TFBGA, 48/WFBGA, 48/XFLGA
SST39VF801C	8	512K $\times$ 16	70 ns	Bottom	48/TSOP, 48/TFBGA, 48/WFBGA
SST39VF802C	8	512K $\times$ 16	70 ns	Top	48/TSOP, 48/TFBGA, 48/WFBGA
SST39VF1601C	16	1M $\times$ 16	70 ns	Bottom	48/TSOP, 48/TFBGA, 48/WFBGA
SST39VF1602C	16	1M $\times$ 16	70 ns	Top	48/TSOP, 48/TFBGA, 48/WFBGA
SST39VF3201C	32	2M $\times$ 16	70 ns	Bottom	48/TSOP, 48/TFBGA
SST39VF3202C	32	2M $\times$ 16	70 ns	Top	48/TSOP, 48/TFBGA
SST38VF6401B	64	4M $\times$ 16	70 ns	Bottom	48/TSOP, 48/TFBGA
SST38VF6402B	64	4M $\times$ 16	70 ns	Top	48/TSOP, 48/TFBGA
SST38VF6403B	64	4M $\times$ 16	70 ns	Bottom*	48/TSOP, 48/TFBGA
SST38VF6404B	64	4M $\times$ 16	70 ns	Top*	48/TSOP, 48/TFBGA

* All listed devices feature a uniform 32 KW block-erase including the boot blocks except for the SST38VF6403B and SST38VF6404B which are non-uniform. These devices feature 32 KW block-erase everywhere except for the boot block sector which is only 4 KW block-erase.

Product Cross Reference

Density	Mircochip (SST)	Spansion	Micron/Numonyx	Macronix
4 Mbit	SST39VF40XC	S29AL004D	M29W400DB/T	MX29LV040C
8 Mbit	SST39VF80XC	S29AL008J	M29W800DB/T	MX29LV800C
16 Mbit	SST39VF160XC	S29AL016J	M28W160C/E	MX29LV160D/MX29LF161D
32 Mbit	SST39VF320XC	S29AL032N/S29AL032D	M29W320D/E	MX29LV320D
64 Mbit	ST38VF640XB	S29GL064N/S29GL064A	M28W064FB	MX29GL640E/MX29LV640E



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