

SuperFlash® Memory Products

High Performance, Low Power Consumption and Superior Reliability

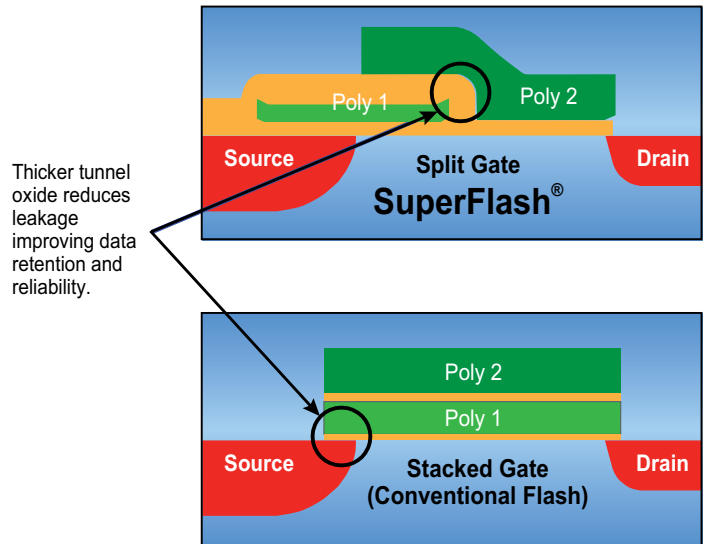
What is SuperFlash?

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

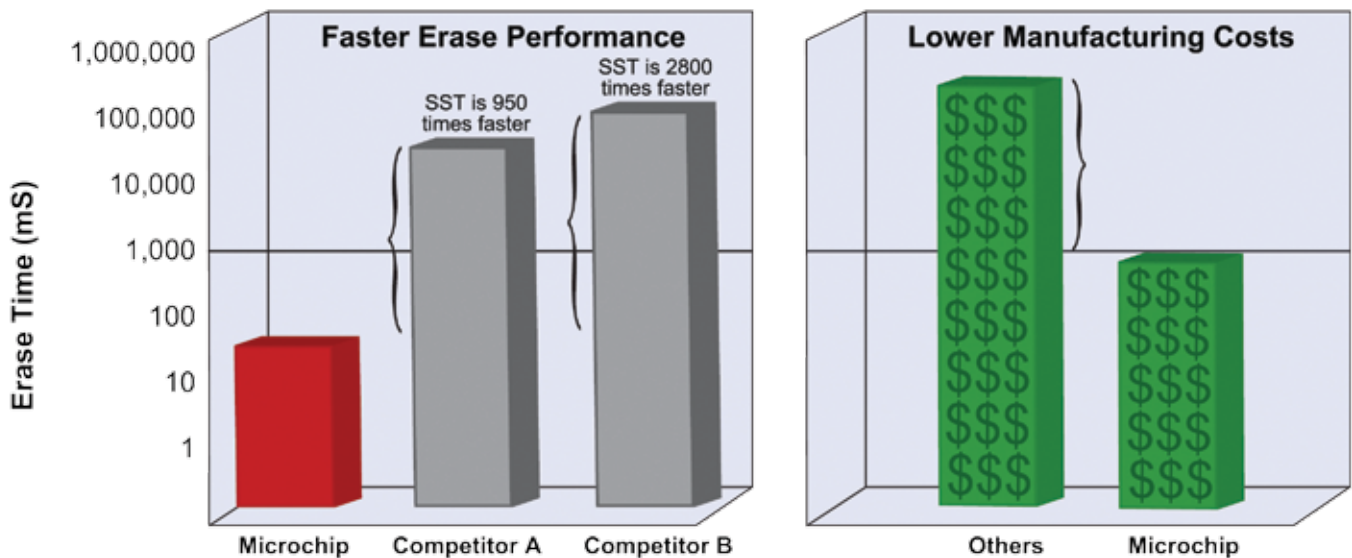
Memory Cell Structure Comparison



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 ().

| 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 |



MICROCHIP
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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 TSPOP
 - 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