

32M-BIT [x 1 / x 2] CMOS SERIAL FLASH**FEATURES****GENERAL**

- Single Power Supply Operation
 - 2.7 to 3.6 volt for read, erase, and program operations
- Serial Peripheral Interface compatible -- Mode 0 and Mode 3
- 33,554,432 x 1 bit structure or 16,777,216 x 2 bits (Dual Output mode) structure
- 1024 Equal Sectors with 4K byte each
 - Any Sector can be erased individually
- 64 Equal Blocks with 64K byte each
 - Any Block can be erased individually
- Program Capability
 - Byte base
 - Page base (256 bytes)
- Latch-up protected to 100mA from -1V to Vcc +1V

PERFORMANCE

- High Performance
 - Fast access time: 86MHz serial clock
 - Serial clock of Dual Output mode : 80MHz
 - Fast program time: 1.4ms(typ.) and 5ms(max.)/page
 - Byte program time: 9us (typical)
 - Fast erase time: 60ms(typ.) /sector ; 0.7s(typ.) /block
- Low Power Consumption
 - Low active read current: 25mA(max.) at 86MHz
 - Low active programming current: 20mA (max.)
 - Low active erase current: 20mA (max.)
 - Standby current: 40uA (max.)
 - Deep power-down mode 5uA (typical)
- Typical 100,000 erase/program cycles
- 20 years of data retention

SOFTWARE FEATURES

- Input Data Format
 - 1-byte Command code
- Advanced Security Features
 - Block lock protection

The BP3~BP0 status bit defines the size of the area to be software protection against program and erase instructions

 - Additional 512 bits secured OTP for unique identifier
- Auto Erase and Auto Program Algorithm
 - Automatically erases and verifies data at selected sector
 - Automatically programs and verifies data at selected page by an internal algorithm that automatically times the program pulse widths (Any page to be programmed should have page in the erased state first)

- Status Register Feature
- Electronic Identification
 - JEDEC 1-byte manufacturer ID and 2-byte device ID
 - RES command for 1-byte Device ID
 - REMS command for 1-byte manufacturer ID and 1-byte device ID
- Support Serial Flash Discoverable Parameters (SFDP) mode

HARDWARE FEATURES

- PACKAGE
 - 16-pin SOP (300mil)
 - 8-pin SOP (200mil)
 - 8-pin PDIP (300mil)
 - 8-land WSON (6x5mm)
 - 8-land USON (4x4mm)
 - 24-Ball BGA
 - **All devices are RoHS Compliant**

GENERAL DESCRIPTION

The device feature a serial peripheral interface and software protocol allowing operation on a simple 3-wire bus. The three bus signals are a clock input (SCLK), a serial data input (SI), and a serial data output (SO). Serial access to the device is enabled by CS# input.

When it is in Dual Output read mode, the SI and SO pins become SIO0 and SIO1 pins for data output.

The device provides sequential read operation on whole chip.

After program/erase command is issued, auto program/erase algorithms which program/erase and verify the specified page or sector/block locations will be executed. Program command is executed on byte basis, or page basis, or word basis for erase command is executes on sector, or block, or whole chip basis.

To provide user with ease of interface, a status register is included to indicate the status of the chip. The status read command can be issued to detect completion status of a program or erase operation via WIP bit.

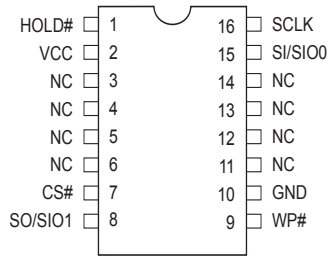
Advanced security features enhance the protection and security functions, please see security features section for more details.

When the device is not in operation and CS# is high, it is put in standby mode.

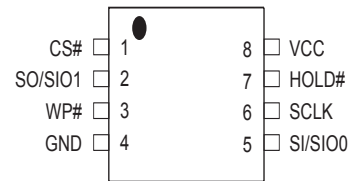
The device utilizes Macronix's proprietary memory cell, which reliably stores memory contents even after typical 100,000 program and erase cycles.

PIN CONFIGURATIONS

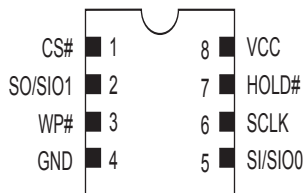
16-PIN SOP (300mil)



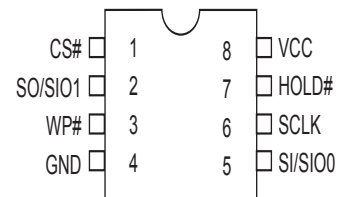
8-PIN SOP (200mil)



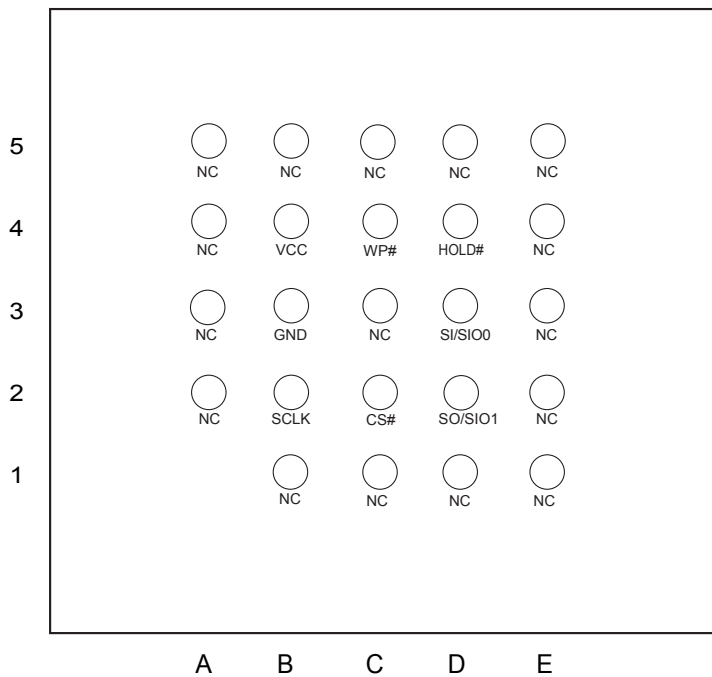
8-LAND WSON (6x5mm), USON (4x4mm)



8-PIN PDIP (300mil)



24-BALL BGA



PIN DESCRIPTION

SYMBOL	DESCRIPTION
CS#	Chip Select
SI/SIO0	Serial Data Input (for 1 x I/O)/ Serial Data Input & Output (for Dual Output mode)
SO/SIO1	Serial Data Output (for 1 x I/O)/ Serial Data Output (for Dual Output mode)
SCLK	Clock Input
WP#	Write protection
HOLD#	Hold, to pause the device without deselecting the device
VCC	+ 3.3V Power Supply
GND	Ground