



1. GENERAL DESCRIPTIONS

The W25Q64FW (64M-bit) Serial Flash memory provides a storage solution for systems with limited space, pins and power. The 25Q series offers flexibility and performance well beyond ordinary Serial Flash devices. They are ideal for code shadowing to RAM, executing code directly from Dual/Quad SPI (XIP) and storing voice, text and data. The device operates on a single 1.65V to 1.95V power supply with current consumption as low as 4mA active and 1µA for power-down. All devices are offered in space-saving packages.

The W25Q64FW array is organized into 32,768 programmable pages of 256-bytes each. Up to 256 bytes can be programmed at a time. Pages can be erased in groups of 16 (4KB sector erase), groups of 128 (32KB block erase), groups of 256 (64KB block erase) or the entire chip (chip erase). The W25Q64FW has 4,096 erasable sectors and 256 erasable blocks respectively. The small 4KB sectors allow for greater flexibility in applications that require data and parameter storage. (See Figure 2.)

The W25Q64FW support the standard Serial Peripheral Interface (SPI), Dual/Quad I/O SPI as well as 2-clocks instruction cycle Quad Peripheral Interface (QPI): Serial Clock, Chip Select, Serial Data I/O0 (DI), I/O1 (DO), I/O2 (/WP), and I/O3 (/HOLD). SPI clock frequencies of up to 104MHz are supported allowing equivalent clock rates of 208MHz (104MHz x 2) for Dual I/O and 416MHz (104MHz x 4) for Quad I/O when using the Fast Read Dual/Quad I/O and QPI instructions. These transfer rates can outperform standard Asynchronous 8 and 16-bit Parallel Flash memories. The Continuous Read Mode allows for efficient memory access with as few as 8-clocks of instruction-overhead to read a 24-bit address, allowing true XIP (execute in place) operation.

A Hold pin, Write Protect pin and programmable write protection, with top or bottom array control, provide further control flexibility. Additionally, the device supports JEDEC standard manufacturer and device ID, a 64-bit Unique Serial Number and three 256-bytes Security Registers.

2. FEATURES

- **New Family of SpiFlash Memories**
 - W25Q64FW: 64M-bit / 8M-byte
 - Standard SPI: CLK, /CS, DI, DO, /WP, /Hold
 - Dual SPI: CLK, /CS, IO₀, IO₁, /WP, /Hold
 - Quad SPI: CLK, /CS, IO₀, IO₁, IO₂, IO₃
 - QPI: CLK, /CS, IO₀, IO₁, IO₂, IO₃
 - Software & Hardware Reset
- **Highest Performance Serial Flash**
 - 104MHz Single, Dual/Quad SPI clocks
 - 208/416MHz equivalent Dual/Quad SPI
 - 50MB/S continuous data transfer rate
 - More than 100,000 erase/program cycles
 - More than 20-year data retention
- **Efficient “Continuous Read” and QPI Mode**
 - Continuous Read with 8/16/32/64-Byte Wrap
 - As few as 8 clocks to address memory
 - Quad Peripheral Interface (QPI) reduces instruction overhead
 - Allows true XIP (execute in place) operation
 - Outperforms X16 Parallel Flash
- **Low Power, Wide Temperature Range**
 - Single 1.65 to 1.95V supply
 - 4mA active current, <1µA Power-down (typ.)
 - -40°C to +85°C operating range
- **Flexible Architecture with 4KB sectors**
 - Uniform Sector/Block Erase (4K/32K/64K-Byte)
 - Program 1 to 256 byte per programmable page
 - Erase/Program Suspend & Resume
- **Advanced Security Features**
 - Software and Hardware Write-Protect
 - Power Supply Lock-Down and OTP protection
 - Top/Bottom, Complement array protection
 - Individual Block/Sector array protection
 - 64-Bit Unique ID for each device
 - 4X256-Bytes Security Registers with OTP locks
 - Volatile & Non-volatile Status Register Bits
- **Space Efficient Packaging**
 - 8-pin SOIC/VSOP 208-mil
 - 8-pad WSON 6x5-mm / 8x6-mm
 - 16-pin SOIC 300-mil (additional /RESET pin)
 - 16-ball WLPGA
 - 24-ball TFBGA 8x6-mm
 - Contact Winbond for KGD and other options



3. PACKAGE TYPES AND PIN CONFIGURATIONS

3.1 Pin Configuration SOIC / VSOP 208-mil

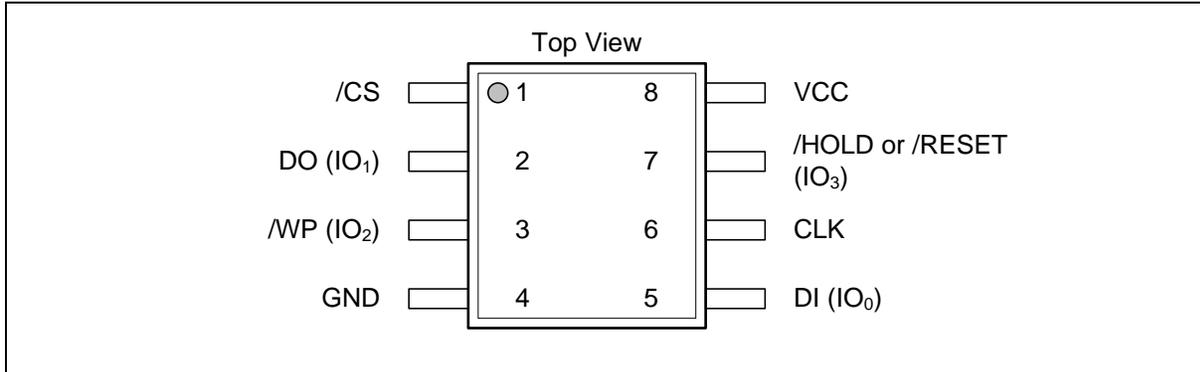


Figure 1a. W25Q64FW Pin Assignments, 8-pin SOIC / VSOP 208-mil (Package Code SS, ST)

3.2 Pad Configuration WSON 6x5-mm / 8x6-mm

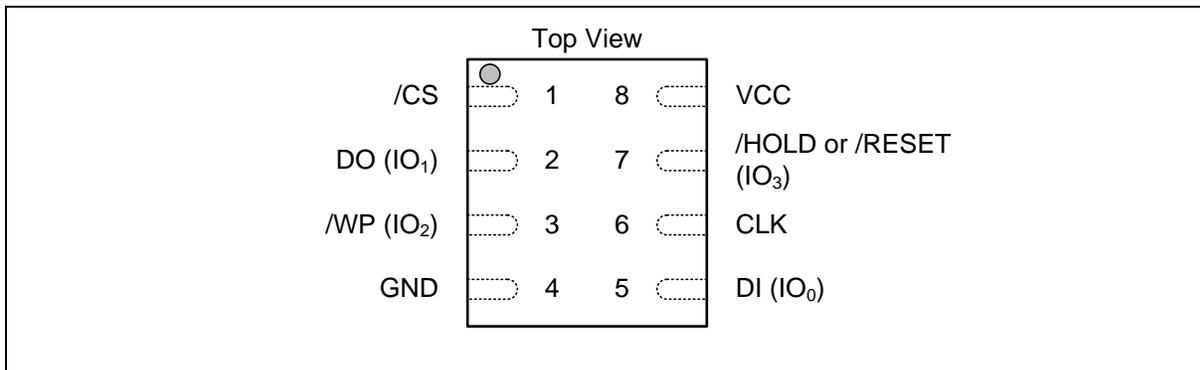


Figure 1b. W25Q64FW Pad Assignments, 8-pad WSON 6x5-mm / 8x6-mm (Package Code ZP, ZE)

3.3 Pin Description SOIC/VSOP 208-mil, WSON 6x5-mm / 8x6-mm

PIN NO.	PIN NAME	I/O	FUNCTION
1	/CS	I	Chip Select Input
2	DO (IO ₁)	I/O	Data Output (Data Input Output 1) ⁽¹⁾
3	/WP (IO ₂)	I/O	Write Protect Input (Data Input Output 2) ⁽²⁾
4	GND		Ground
5	DI (IO ₀)	I/O	Data Input (Data Input Output 0) ⁽¹⁾
6	CLK	I	Serial Clock Input
7	/HOLD or /RESET (IO ₃)	I/O	Hold or Reset Input (Data Input Output 3) ⁽²⁾
8	VCC		Power Supply

Notes:

1. IO0 and IO1 are used for Standard and Dual SPI instructions
2. IO0 – IO3 are used for Quad SPI instructions, /WP & /HOLD (or /RESET) functions are only available for Standard/Dual SPI.