Winbond's W25X and W25Q SpiFlash® Multi-I/O Memories feature the popular Serial Peripheral Interface (SPI), densities from 512K-bit to 512M-bit, small erasable sectors and the industry's highest performance. The W25X family supports Dual-SPI effectively doubling standard SPI clock rates. The W25Q family is a "superset" of the 25X family with Dual-I/O and Quad-I/O SPI for even higher performance. Clock rates up to 104MHz achieve an equivalent of 416MHz (50M-Byte/s transfer rate) when using Quad-SPI. This even surpasses asynchronous Parallel Flash memories while using fewer pins and less space. Faster transfer rates mean controllers can execute code (XIP) directly from the SPI interface or further improve boot time when shadowing code to RAM. Some SpiFlash® devices offer the new Quad Peripheral Interface (QPI) supporting true Quad Commands for improved XIP performance and simpler controller circuitry. Additionally, new ultra-small form-factor packages are ideal for space constrained mobile and handheld applications.

**W25X SpiFlash® Family**
- 512K-bit to 4M-bit
- Serial Peripheral Interface (SPI), Dual Output SPI
- Uniform 4KB, 32KB & 64KB erase

**W25Q SpiFlash® Family**
- 2M-bit to 512M-bit, superset compatible with 25X
- SPI, Dual-SPI, Quad-SPI and QPI (for many devices)
- Uniform 4KB, 32KB & 64KB erase
- Erase and Program Suspend/Resume
- Quad Page Program
- Security: Lock-down, ID#, OTP Registers
- Serial Flash Discoverable Parameters (SFDP)

**High Performance**
- 104MHz Clock, 416MHz Quad-SPI (50MB/s)
- Fast-boot or execute code (XIP) from SPI

**Voltage & Package Options**
- 3V (2.7~3.6V), 2.5V (2.3~3.6V) and 1.8V (1.65~1.95V)
- Space saving packages: 8-pin SOIC, WSON, VSOP, USON, WLCSP, 16-pin SOIC, 24-ball TFBGA
- Known Good Die (KGD) Wafers

**Wide Range of Applications**
- PCs, DVD, BluRay, WLAN, DSL/Cable Modem, Printers,
- Hard Drives, Set Top Box, LCD-TV, Mobile Phones,
- Bluetooth, GPS, MP3, Meters, DSP, FPGAs and more

Refer to Winbond Automotive SpiFlash® Memory Selection Guide for details of Automotive products.

Winbond also offers the W29N family of industry standard SLC NAND products from 1Gb through 8Gb, and QspiNAND from 512Mb through 4Gb densities.
## Winbond Industrial SpiFlash® Memory Selection Guide

### Density | Winbond Part #  | Quad SPI | Clock Mhz | Features | Voltage | Package
---|---|---|---|---|---|---
512M-bit | W25M512JWxI/Q | • 104 | QPI, Enhanced, DTR | 1.8V | x=(F,E,C8,B) |
256M-bit | W25Q512JxI/MIQ | • 104/133 | QPI, Enhanced, DTR | 3V | x=(F,E,C8,B) |
4x3mm, UU=USON8 4x3mm, XG=XSON8 4x4mm, BY=WLCSP. KGD Wafer available. | | |
32M-bit | W25Q256JWxI/MQ | • 104/133 | QPI, Enhanced, DTR | 1.8V | x=(F,E,C8,B8) |
128M-bit | W25Q128JVxM/Q | • 104/133 | QPI, Enhanced, DTR | 3V | x=(S,T,F,P,E,C8,B8) |
64M-bit | W25Q128JWxI/MQ | • 104 | QPI, Enhanced | 1.2V | xx=(S,S,T,S,F,ZP,BY) |
| W25Q256JxI/MQ | • 104 | QPI, Enhanced, DTR | 3V | xx=(S,S,T,S,F,ZP,BY) |
16M-bit | W25Q16JxI/MQ | • 104 | QPI, Enhanced, DTR | 3V | xx=(S,S,T,S,F,ZP,BY) |
32M-bit | W25Q32JxI/MQ | • 133 | QPI, Enhanced, DTR | 3V | xx=(S,S,T,S,F,ZP,BY) |
4M-bit | W25Q40JxI/G | • 80/104 | Enhanced | 2.5V/3V | xx=(S,S,V,S,SS,ZP) |
8M-bit | W25Q80JxI/G/E7 | • 104 | Fast Write, Enhanced | 3V | xx=(S,S,V,S,SS,ZP,UX,BY) |
| W25Q80JxI/G/E7 | • 80/104 | Fast Write, Enhanced | 2.3V-3.6V | xx=(S,S,V,S,SS,ZP,UX,BY) |
1M-bit | W25X10CLxI/G/E7 | • 104 | Fast Write, Enhanced | 2.3V-3.6V | xx=(S,S,V,S,SS,ZP,UX,BY) |
512k-bit | W25X512CLxI/G | • 80/104 | Fast Write | 2.3V-3.6V | xx=(S,S,V,S,SS,ZP,UX,BY) |

1. See data sheet for further technical information. This is subject to change without notice. 2. At the end of the part number, letter “J” represents “Green”, Halogen Free and RoHS compliant packaging; letter “G” represents Green packaging and Quad Enabled as shipping default & fast sector erase time (tSE); letter “F” represents Fast Sector Erase time (tSE); letter “I” represents Industrial Temperature (40°C to +85°C). 3. Enhanced=SFDP. Security Registers, Program/Erase Suspend/Resume, Burst Read with Wrap, Non-Volatile & Volatile Status Registers, Complement Array Protection. 4. SN=SIO8 150mil, SV=VSOP8 150mil, SS or S=SIO8 208mil, ST or T=VSOP8 208mil, SF or F=SIO16 300mil, ZP or P=WSON8 6x5mm, ZE or E=WSON8 8x6mm, TC or C=TFBGA24 8x6mm (4x4 Matrix), TB or B=TFBGA24 8x6mm (5x5 Matrix), UX=USON8 2x3mm, UX=USON8 4x3mm, XG=XSQ8 4x4mm, BY=WLCSP. KGD Wafer available. 5. Default 4-byte addressing for W25W257FV/JV. 6. Special Order. 7. “E” at the end of the part number is for USON8 package only.