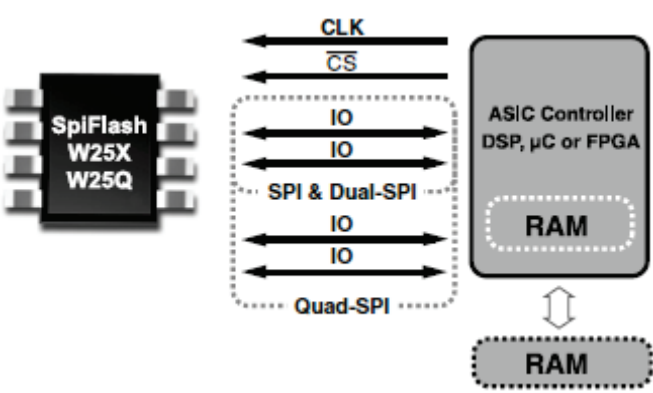


SpiFlash® Memories with SPI, Dual-SPI, Quad-SPI and QPI

Winbond's W25X and W25Q SpiFlash® Multi-I/O Memories feature the popular Serial Peripheral Interface (SPI), densities from 1M to 128M-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 is more than eight times the performance of ordinary Serial Flash (50MHz) and 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. Additionally, some SpiFlash devices offer the new Quad Peripheral Interface (QPI) supporting true Quad Commands for improved XIP performance and simpler controller circuitry.



W25X SpiFlash Family

- 1M to 4M-bit (25Q recommended for higher densities)
- Serial Peripheral Interface (SPI), Dual Output SPI
- Uniform 4KB, 32KB & 64KB erase

W25Q SpiFlash Family

- 2M to 128M-bit, superset compatible with 25X
- SPI, Dual-SPI, Quad-SPI and QPI (for some 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)
- >8X speed of most Serial Flash
- Fast-boot or execute code (XIP) from SPI

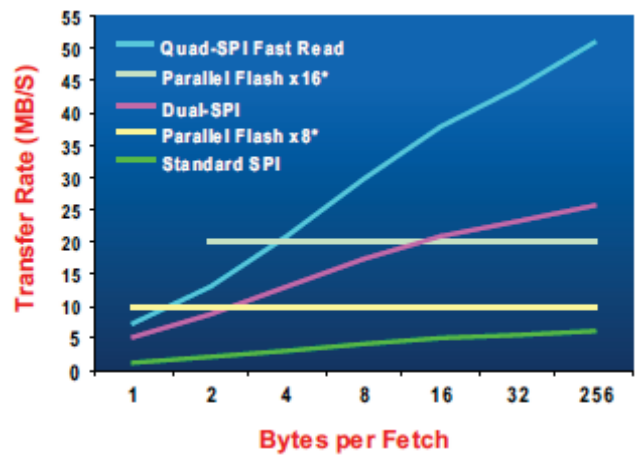
Voltage & Package Options

- 3V, 2.5V and 1.8V operation
- Space saving packages: 8-pin SOIC, WSON, DIP, 16-pin SOIC, 24-ball TFBGA
- Known Good Die (KGD) Wafers

Wide Range of Applications

- PCs, DVD, BluRay, WLAN, DSL, Cable, Printers,
- Hard Drives, Set Top Box, LCD-TV, Mobile Phones,
- Bluetooth, GPS, MP3, Meters, DSP, FPGAs and more

Random Access Performance



Winbond also offers the W29GL family of Parallel Flash products from 32Mb through 256Mb densities compatible to industry standard x29GL products.





Winbond SpiFlash Memory Selection Guide ^{1,2}

Density	Winbond Part #	SPI/ Dual	Quad SPI	Clock MHz	Features ³	Voltage ⁴	Package ⁵	Temp. ⁸	Sample Availability
512K-bit	W25X05CLxxIG	•		50/104	Fast Write	2.5/3V	xx=(SN ⁶ ,SD ⁷ ,ZP ⁶ ,UX ⁶)	I	Now
	W25Q05CLxxIG	•	•	104	Fast Write	2.5/3V	xx=(SN,SD ⁷ ,ZP ⁶ ,UX ⁶)	I	Now
1M-bit	W25X10BVxxIG	•		104		3V	xx=(SN,SV ⁶ ,ZP ⁶ ,UX ⁶)	I	Now
	W25X10CLxxIG	•		50/104	Fast Write	2.5/3V	xx=(SN ⁶ ,SD ⁷ ,ZP ⁶ ,UX ⁶)	I	Now
	W25Q10CLxxIG	•	•	104	Fast Write	2.5/3V	xx=(SN ⁶ ,SD ⁷ ,ZP ⁶ ,UX ⁶)	I	Now
2M-bit	W25X20BVxxIG	•		104		3V	xx=(SN,ZP ⁶ ,UX ⁶)	I	Now
	W25X20BLxxIG	•		50/104		2.5V	xx=(SN,SV ⁶ ,ZP,UX)	I	Now
	W25X20CLxxIG	•		50/104	Fast Write	2.5/3V	xx=(SN,SV ⁶ ,ZP,UX)	I	Now
	W25Q20CLxxIG	•	•	104	Fast Write	2.5/3V	xx=(SN,ZP ⁶ ,UX ⁶)	I	Now
	W25Q20BWxxIG	•	•	80	Fast Write, Enhanced	1.8V	xx=(SN ⁶ ,SV ⁶ ,ZP,UX ⁷)	I	Now
4M-bit	W25X40BVxxI/AG	•		80/104		3V	xx=(SN,SV ⁶ ,SS,ZP,DA,UX ⁶)	I, A	Now
	W25X40BLxxIG	•		50/104		2.5V	xx=(SN,SV ⁶ ,SS ⁶ ,ZP,DA ⁶ ,UX)	I	Now
	W25X40CLxxIG	•		50/104	Fast Write	2.5/3V	xx=(SN,SV ⁶ ,SS ⁶ ,ZP,DA ⁶ ,UX)	I	Q2-2012
	W25Q40BVxxIG	•	•	80/104	Enhanced	3V	xx=(SN,SV ⁶ ,SS,ZP ⁶ ,DA ⁶ ,UX ⁶)	I	Now
	W25Q40BLxxIG	•	•	50/104	Fast Write, Enhanced	2.5V	xx=(SN,SV,SS,ZP,DA ⁶ ,UX ⁶)	I	Now
	W25Q40CLxxIG	•	•	104	Fast Write	2.5/3V	xx=(SN,SV ⁶ ,SS,ZP ⁶ ,DA ⁶ ,UX ⁶)	I	Q2-2012
	W25Q40BWxxIG	•	•	80	Fast Write, Enhanced	1.8V	xx=(SN,SV ⁶ ,SS ⁶ ,ZP,UX)	I	Now
8M-bit	W25Q80BVxxI/AG	•	•	80/104	Enhanced	3V	xx=(SN,SV ⁶ ,SS,ST ⁷ ,ZP,DA,UX ⁶ ,TC ⁶ ,TB ⁶)	I, A	Now
	W25Q80BLxxIG	•	•	50/80	Fast Write, Enhanced	2.5V	xx=(SN,SV ⁶ ,SS,ST ⁷ ,ZP,DA ⁶ ,UX)	I	Now
	W25Q80BWxxIG	•	•	80	Fast Write, Enhanced	1.8V	xx=(SN,SV ⁷ ,SS,ST ⁷ ,ZP,BY)	I	Now
	W25Q80DWxxIG	•	•	104	Fast Write, Enhanced	1.8V	xx=(SN,SV ⁷ ,SS,ST ⁷ ,ZP)	I	Q1-2012
16M-bit	W25Q16BVxxIG	•	•	80/104		3V	xx=(SN ⁶ ,SS,SF,ZP,DA)	I	Use W25Q16CV
	W25Q16CVxxI/AG	•	•	80/104	Enhanced	3V	xx=(SN ⁶ ,SV ⁷ ,SS,ST ⁷ ,SF,ZP,DA,TC ⁶ ,TB ⁶)	I, A	Now
	W25Q16CLxxIG	•	•	50/80	Enhanced	2.5V	xx=(SN ⁶ ,SV ⁷ ,SS,ST ⁷ ,SF ⁶ ,ZP ⁶ ,DA ⁶ ,TC ⁶ ,TB ⁶)	I	Now
	W25Q16DWxxIG	•	•	104	QPI, Enhanced	1.8V	xx=(SN ⁶ ,SV ⁷ ,SS,ST ⁷ ,SF ⁶ ,ZP,DA ⁶ ,TC ⁶ ,TB ⁶ ,BY)	I	Now
32M-bit	W25Q32BVxxI/AG	•	•	80/104	Enhanced	3V	xx=(SS,ST ⁷ ,SF,ZP,ZE ⁶ ,DA,TC ⁶ ,TB ⁶)	I, A	Now
	W25Q32FVxxI/AG	•	•	104	QPI, Enhanced	3V	xx=(SS,ST ⁷ ,SF,ZP,ZE ⁶ ,DA,TC ⁶ ,TB ⁶)	I	Q3-2012
	W25Q32DWxxIG	•	•	104	QPI, Enhanced	1.8V	xx=(SS,ST ⁷ ,SF ⁶ ,ZP,ZE ⁶ ,TC ⁶ ,TB ⁶)	I	Now
64M-bit	W25Q64BVxxIG	•	•	80		3V	xx=(SS,SF,ZE,DA)	I	Use W25Q64FV
	W25Q64CVxxI/AG	•	•	80	Enhanced	3V	xx=(SS,ST ⁷ ,SF,ZP,ZE,DA,TC ⁶ ,TB ⁶)	I, A	Now
	W25Q64FVxxIG	•	•	104	QPI, Enhanced	3V	xx=(SS,ST ⁷ ,SF,ZP,ZE,DA,TC, TB ⁶)	I	Now
	W25Q64DWxxIG	•	•	104	QPI, Enhanced	1.8V	xx=(SS,ST ⁷ ,SF,ZP,ZE,TC ⁶ ,TB ⁶)	I	Now
	W25Q64FWxxIG	•	•	104	QPI, Enhanced	1.8V	xx=(SS,ST ⁷ ,SF,ZP,ZE,TC ⁶ ,TB ⁶)	I	Q3-2012
128M-bit	W25Q128BVxxI/AG	•	•	70/104	Enhanced	3V	x=(F,E,C ⁶ ,B ⁶)	I, A	Now
	W25Q128FVxxIG	•	•	104	QPI, Enhanced	3V	x=(S,T ⁷ ,F,P,E,A ⁶ ,C ⁶ ,B ⁶)	I	Now
	W25Q128FWxxIG	•	•	104	QPI, Enhanced	1.8V	x=(S,T ⁷ ,F,P,E,C ⁶ ,B ⁶)	I	Q2-2012
256M-bit	W25Q256FVxxIG	•	•	104	QPI, Enhanced	3V	x=(F,E,C ⁶ ,B ⁶)	I	Now

1. See data sheet for further technical information. Some special features, such as OTP Write Protection, are special order. 2. Subject to change without notice. 3. Enhanced=SFDP, Security Registers, Program/Erase Suspend/Resume, Word Read Quad I/O, Burst Read with Wrap, Non-Volatile & Volatile Status Registers, Complement Array Protection. 4. Voltage 3V=2.7-3.6V, 2.5V=2.3-3.6V, 1.8V=1.65-1.95V. 5. "Green" and RoHS compliant packaging. KGD Wafer also available. SN=SO8 150mil, SV=VSOP8 150mil, SS or S=SO8 208mil, ST or T=VSOP8 208mil, SF or F=SO16 300mil, SD= TSSOP8 173mil, ZP or P=WSON8 6x5mm, ZE or E=WSON8 8x6mm, DA or A=PDIP8 300mil, TC or C=TFBGA24 8x6mm (4x6 Matrix), TB or B=TFBGA24 8x6mm (5X5 Matrix), UX=USON8 2x3mm, BY=WLPGA8. 6. Special Order. 7. Under Development. 8. Temperature I=Industrial (-40C to +85C), A=Automotive (-40C to +105C). Contact Winbond for availability of products under development, special order and Automotive products.



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