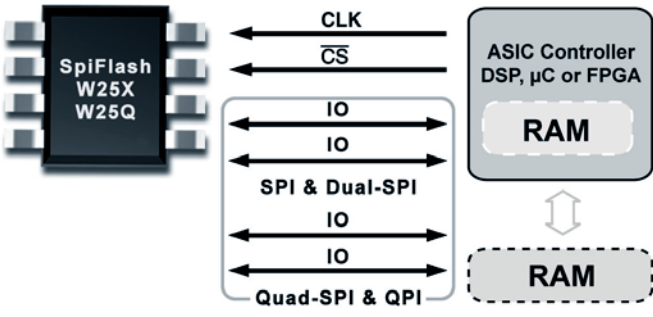


## SpiFlash® Memories with SPI, Dual-SPI, Quad-SPI and QPI

Winbond's W25X and W25Q SpiFlash® Multi-I/O Memories feature the popular Serial Peripheral Interface (SPI), densities from 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

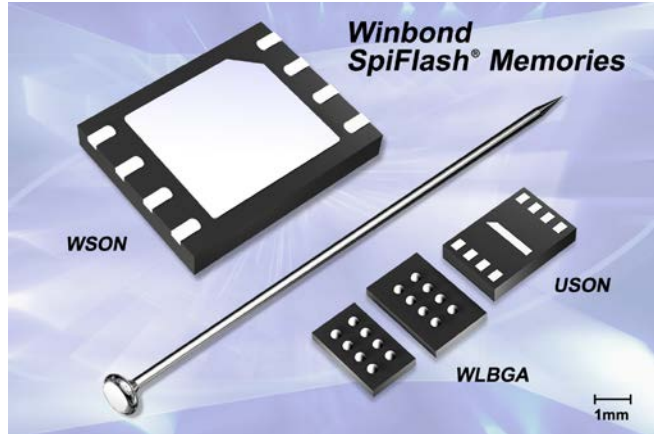
- 104MHz Clock, 416MHz Quad-SPI (50MB/S)
- Fast-boot or execute code (XIP) from SPI

### 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 W29GL family of Parallel Flash products from 32Mb through 256Mb densities compatible to industry standard x29GL products.





## Winbond Industrial SpiFlash Memory Selection Guide <sup>1</sup>

Density	Winbond Part # <sup>2</sup>	Quad SPI	Clock MHz	Features <sup>3</sup>	Voltage	Package <sup>4</sup>	Sample Availability
512M-bit	W25M512JVxlQ	•	104	QPI, Enhanced, DTR	3V	x=(F,E,C <sup>6</sup> ,B)	Now
256M-bit	W25Q256FVxlG/Q/F	•	80/104	QPI, Enhanced	3V	x=(F,E <sup>6</sup> ,C <sup>6</sup> ,B <sup>6</sup> )	Use W25Q256JV
	W25Q257FVxlF/Q <sup>5</sup>	•	80/104	QPI, Enhanced	3V	x=(F,E)	Now
	W25Q256JVxlQ	•	104/133	QPI, Enhanced, DTR	3V	x=(F,E,C <sup>6</sup> ,B <sup>6</sup> )	Now
	W25M256JVxlQ	•	104	QPI, Enhanced, DTR	3V	x=(S,F,P,E,C <sup>6</sup> ,B <sup>6</sup> )	Q2-2017
	W25Q256JWxlQ	•	104/133	QPI, Enhanced, DTR	1.8V	x=(F,E,C <sup>6</sup> ,B <sup>6</sup> )	Now
128M-bit	W25Q128FVxlG/Q/F	•	104	QPI, Enhanced	3V	x=(S,T <sup>6</sup> ,F,P,E <sup>6</sup> ,C <sup>6</sup> ,B <sup>6</sup> )	Use W25Q128JV
	W25R128FVxlQ	•	104	RPMC, Enhanced	3V	x=(S,T <sup>6</sup> ,F <sup>6</sup> ,P <sup>6</sup> )	Now
	W25Q128JVxlQ	•	104/133	QPI, Enhanced, DTR	3V	x=(S,T <sup>6</sup> ,F,P,E,C <sup>6</sup> ,B <sup>6</sup> )	Now
	W25Q128FWxlG/Q	•	104	QPI, Enhanced	1.8V	x=(S,F <sup>6</sup> ,P <sup>6</sup> )	Now
64M-bit	W25Q64FVxxlG/Q/F	•	104	QPI, Enhanced	3V	xx=(SS,ST <sup>6</sup> ,SF,ZP,ZE,TC,TB <sup>6</sup> ,BY <sup>6</sup> )	Use W25Q64JV
	W25R64FVxxlQ	•	104	RPMC, Enhanced	3V	xx=(SS,ST <sup>6</sup> ,SF <sup>6</sup> ,ZP <sup>6</sup> )	Now
	W25Q64JVxxlQ	•	104/133	QPI, Enhanced, DTR	3V	xx=(SS,ST <sup>6</sup> ,SF,ZP,ZE,XG <sup>6</sup> ,TC,TB <sup>6</sup> )	Now
	W25Q64FWxxlG/Q	•	104	QPI, Enhanced	1.8V	xx=(SS,ST <sup>6</sup> ,SF <sup>6</sup> ,ZP,BY)	Now
32M-bit	W25Q32FVxxlG/Q/F	•	104	QPI, Enhanced	3V	xx=(SS,ST <sup>6</sup> ,SF,ZP,ZE,TC <sup>6</sup> ,TB <sup>6</sup> )	Use W25Q32JV
	W25Q32JVxxlQ	•	104/133	QPI, Enhanced, DTR	3V	xx=(SS,ST <sup>6</sup> ,SF,ZP,XG <sup>6</sup> ,TC <sup>6</sup> ,TB <sup>6</sup> )	Now
	W25Q32FWxxlG/Q	•	104	QPI, Enhanced	1.8V	xx=(SS,ST <sup>6</sup> ,SF <sup>6</sup> ,ZP,ZE <sup>6</sup> ,XG,BY <sup>6</sup> )	Now
16M-bit	W25Q16DVxxlG/Q	•	80/104	Enhanced	3V	xx=(SN,SV <sup>6</sup> ,SS,ST <sup>6</sup> ,ZP,UU <sup>6</sup> ,TC <sup>6</sup> ,TB <sup>6</sup> )	Use W25Q16JV
	W25Q16JVxxlQ	•	104/133	Enhanced, DTR	3V	xx=(SN,SV <sup>6</sup> ,SS,ST <sup>6</sup> ,ZP,UU <sup>6</sup> ,XG <sup>6</sup> ,UX,BY)	Now
	W25Q16CLxxlG	•	50/80	Enhanced	2.5V/3V	xx=(SN,SV <sup>6</sup> ,SS,ZP)	Now
	W25Q16JLxxlG	•	80/104	Enhanced	2.5V/3V	xx=(SN,SV <sup>6</sup> ,SS,ZP)	Q2-2017
	W25Q16DWxxlG	•	104	QPI, Enhanced	1.8V	xx=(SN,SS,ST <sup>6</sup> ,SF <sup>6</sup> ,ZP,UU,BY <sup>6</sup> )	Use W25Q16FW
	W25Q16FWxxlG/Q/E <sup>7</sup>	•	104	QPI, Enhanced	1.8V	xx=(SS,ST <sup>6</sup> ,ZP,UX,UU,XG <sup>6</sup> ,BY <sup>6</sup> )	Now
8M-bit	W25Q80DVxxlG/E <sup>7</sup>	•	104	Fast Write, Enhanced	3V	xx=(SN,SV,SS,ZP,UX,BY <sup>6</sup> )	Now
	W25Q80BLxxlG	•	50/80	Fast Write, Enhanced	2.5V	xx=(SN,SV,SS,ZP,UX)	Use W25Q80DL
	W25Q80DLxxlG/E <sup>7</sup>	•	80/104	Fast Write, Enhanced	2.5V/3V	xx=(SN,SV,SS,ZP,UX,BY <sup>6</sup> )	Now
	W25Q80EWxxlG/E <sup>7</sup>	•	104	QPI, Fast Write, Enhanced	1.8V	xx=(SN,SV,ZP,UX,BY <sup>6</sup> )	Now
4M-bit	W25X40CLxxlG	•	80/104	Fast Write	2.5V/3V	xx=(SN,SV,SS,ZP,UX)	Now
	W25Q40CLxxlG	•	104	Fast Write, Enhanced	2.5V/3V	xx=(SN,SS,UX <sup>6</sup> )	Now
	W25Q40EWxxlG/E <sup>7</sup>	•	104	QPI, Fast Write, Enhanced	1.8V	xx=(SN,SV,UX,BY <sup>6</sup> )	Now
2M-bit	W25X20CLxxlG	•	80/104	Fast Write	2.5V/3V	xx=(SN,SV,ZP,UX)	Now
	W25Q20CLxxlG	•	80/104	Fast Write	2.5V/3V	xx=(SN,SV,ZP,UX)	Now
	W25Q20EWxxlG/E <sup>7</sup>	•	104	Fast Write, Enhanced	1.8V	xx=(SN,SV,UX,BY <sup>6</sup> )	Now
1M-bit	W25X10CLxxlG	•	80/104	Fast Write	2.5V/3V	xx=(SN,UX)	Now
	W25Q10EWxxlG/E <sup>7</sup>	•	104	Fast Write, Enhanced	1.8V	xx=(SN,SV <sup>6</sup> ,UX,BY <sup>6</sup> )	Now
512K-bit	W25X05CLxxlG	•	80/104	Fast Write	2.5V/3V	xx=(SN,UX)	Now

1. See data sheet for further technical information. This is subject to change without notice. 2. At the end of the part number, letter "G" represents "Green", Halogen Free and RoHS compliant packaging; letter "Q" 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<sup>1</sup>, Security Registers, Program/Erase Suspend/Resume, Burst Read with Wrap, Non-Volatile & Volatile Status Registers, Complement Array Protection. 4. SN=SO8 150mil, SV=VSOP8 150mil, SS or S=SO8 208mil, ST or T=VSOP8 208mil, SF or F=SO16 300mil, ZP or P=WSON8 6x5mm, ZE or E=WSON8 8x6mm, TC or C=TFBGA24 8x6mm (4x6 Matrix), TB or B=TFBGA24 8X6mm (5X5 Matrix), UX=USON8 2x3mm, UU=USON8 4x3mm, XG=XSON8 4x4mm, BY=WLCSP. KGD Wafer available. 5. Default 4-byte addressing for W25W257FV. 6. Special Order. 7. "E" at the end of the part number is for USON8 package only.



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