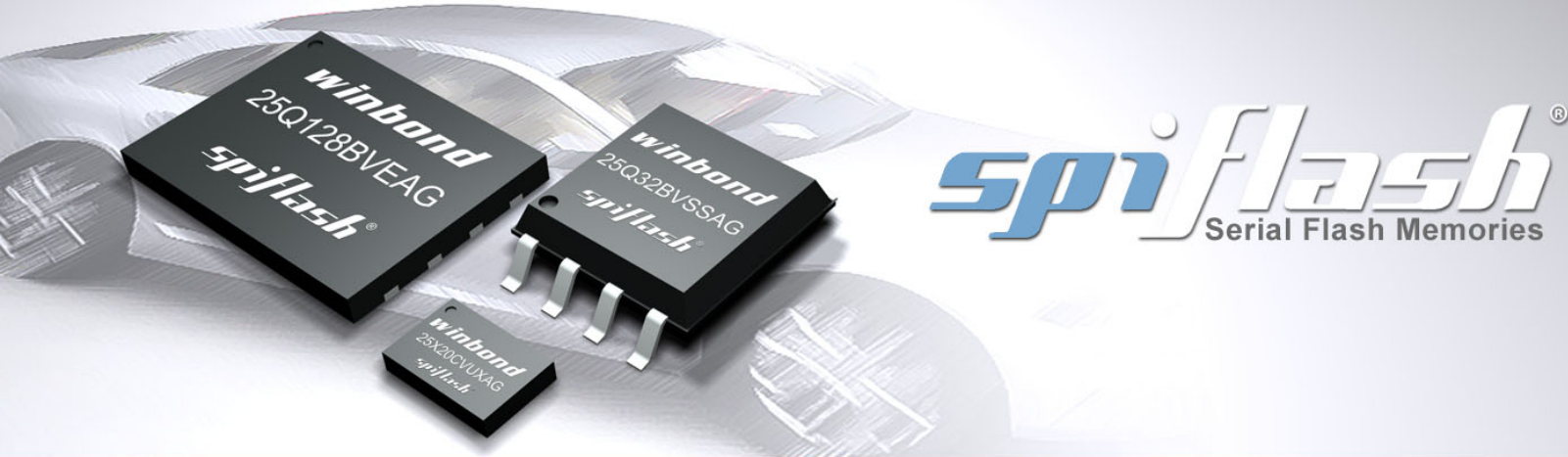




Automotive Certified SpiFlash Memories

Winbond's Automotive W25X and W25Q SpiFlash® Multi-I/O Memories feature the popular Serial Peripheral Interface (SPI), densities from 2M 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 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. Automotive NAND Flash memories are also offered densities of 1Gb and 2Gb serial NAND, and 1Gb through 8Gb of ONFi NAND.

Leading the Serial Flash Market in unit sales and revenue, Winbond TS16949 certified AEC-Q100 qualified memories now support automotive applications. The automobile has transformed into the most sophisticated electronic device in the market. Digital displays in automotive dashboards provide more information about the car, and improve safety. Instant-on and real time 2D/3D image rendering is achieved with fast processors and SpiFlash memories. ADAS (Advanced Driver Assist Systems), comfort, entertainment, and navigation are now available in the center console and this is addressed with SpiFlash memories using small packages for space constrained systems and high density for advanced applications.



W25X and W25Q SpiFlash Families

- 2M to 4M-bit W25X and 2M to 512M-bit W25Q
- Serial Peripheral Interface (SPI), Dual Output SPI W25X
- SPI, Dual-SPI, Quad-SPI W25Q
- Uniform 4KB, 32KB & 64KB erase
- W25Q family also offers Quad Page Program,
- Erase and Program Suspend/Resume
- Security: Lock-down, ID#, OTP Registers

High Performance

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

Voltage & Package Options

- 3V, 2.5V & 1.8V operation
- 8-pin & 16-pin SOIC, USON, and WSON packages
- Known Good Die (KGD) Wafers

NAND Flash Family

- Serial NAND is superset compatible with W25Q
- 1G and 2G-bit SPI, Dual-SPI, Quad-SPI W25N
- ONFi NAND 1G-bit through 8G-bit
- Industry standard compatible products & packages

Wide Range of Applications

- Digital Cluster, Rear/Front Camera, ADAS ECU, Radio / Infotainment, Navigation, Bluetooth, GPS, Telematic / Gateway, Data Recorder, DSP, FPGAs and more

	Industrial Plus	Automotive Grade 3	Automotive Grade 2	Automotive Grade 1
Temperature Range	-40°C~105°C	-40°C~85°C	-40°C~105°C	-40°C~125°C
Part # Example	W25Q80DVSSJG	W25Q80DVSSBG	W25Q80DVSSAG	W25Q80DVSSSG
AEC-Q100 Compliant	No	Yes	Yes	Yes
Change Control (PPAP)	No	Optional	Optional	Optional

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Winbond Automotive SpiFlash Memory Selection Guide ^{1,2,3}

Density	Winbond Part # ^{7,8,9}	SPI	Quad	Voltage ⁴	Package ⁵	Sample
2M-bit	W25X20CVxxJG/BG/AG	•		3V	xx=(SS, SN,ZP ⁶ ,UX ⁶)	Now
	W25X20CVxxSG	•		3V	xx=(SS, SN,ZP ⁶ ,UX ⁶)	Now
	W25Q20EWxxJG/BG/AG	•	•	1.8V	xx=(SS, SN,ZP ⁶ ,UX ⁶)	Now
	W25Q20EWxxSG	•	•	1.8V	xx=(SS, SN,ZP ⁶ ,UX ⁶)	1Q-2018
4M-bit	W25X/Q40CVxxJG/BG/AG	•	•	3V	xx=(SS, SN,ZP ⁶ ,UX ⁶)	Now
	W25X/Q40CVxxSG	•	•	3V	xx=(SS, SN,ZP ⁶ ,UX ⁶)	Now
	W25Q40EWxxJG/BG/AG	•	•	1.8V	xx=(SS, SN,ZP ⁶ ,UX ⁶)	Now
	W25Q40EWxxSG	•	•	1.8V	xx=(SS, SN,ZP ⁶ ,UX ⁶)	1Q-2018
8M-bit	W25Q80DVxxJG/BG/AG	•	•	3V	xx=(SS, SN,ZP ⁶ ,UX ⁶ ,TC ⁶ ,TB ⁶)	Now
	W25Q80DVxxSG	•	•	3V	xx=(SS, SN,ZP ⁶ ,UX ⁶ ,TC ⁶ ,TB ⁶)	Now
	W25Q80EWxxJG/BG/AG	•	•	1.8V	xx=(SS, SN,ZP ⁶ ,UX ⁶ ,TC ⁶ ,TB ⁶)	Now
	W25Q80EWxxSG	•	•	1.8V	xx=(SS, SN,ZP ⁶ ,UX ⁶ ,TC ⁶ ,TB ⁶)	1Q-2018
16M-bit	W25Q16DV/JVxxJG/BG/AG	•	•	3V	xx=(SS, SN,ZP ⁶ ,TC ⁶ ,TB ⁶)	Now
	W25Q16DV/JVxxSG	•	•	3V	xx=(SS, SN,ZP ⁶ ,TC ⁶ ,TB ⁶)	Now
	W25Q16DW/FWxxJG/BG/AG/Q	•	•	1.8V	xx=(SS, SN,ZP ⁶ ,TC ⁶ ,TB ⁶)	Now
	W25Q16FWxxSG/Q	•	•	1.8V	xx=(SS, SN,ZP ⁶ ,TC ⁶ ,TB ⁶)	3Q-2018
32M-bit	W25Q32BV/FV/JVxxJG/BG/AG/Q	•	•	3V	xx=(SS,SF,ZP,ZE ⁶ ,TC ⁶ ,TB ⁶)	Now
	W25Q32BV/FV/JVxxSG/Q	•	•	3V	xx=(SS,SF,ZP,ZE ⁶ ,TC ⁶ ,TB ⁶)	Now
	W25Q32FWxxJQ/BQ/AQ	•	•	1.8V	xx=(SS,SF,ZP,ZE ⁶ ,TC ⁶ ,TB ⁶)	3Q-2017
64M-bit	W25Q64CV/FV/JVxxJG/BG/AG/Q	•	•	3V	xx=(SS,SF,ZP,ZE ⁶ ,TC ⁶ ,TB ⁶)	Now
	W25Q64CV/FV/JVxxSG/Q	•	•	3V	xx=(SS,SF,ZP,ZE ⁶ ,TC ⁶ ,TB ⁶)	Now
	W25Q64FWxxJQ/BQ/AQ	•	•	1.8V	xx=(SS,SF,ZP,ZE ⁶ ,TC ⁶ ,TB ⁶)	3Q-2017
128M-bit	W25Q128BV/FV/JVxxJG/BG/AG/Q	•	•	3V	x=(S ⁷ ,F,E,C ⁶ ,B ⁶)	Now
	W25Q128BV/FV/JVxxSG/Q	•	•	3V	x=(S ⁷ ,F,E,C ⁶ ,B ⁶)	Now
	W25Q128FWxxJQ/BQ/AQ	•	•	1.8V	x=(S ⁷ ,F,E,C ⁶ ,B ⁶)	3Q-2017
256M-bit	W25Q256FV/JVxxJQ/BQ/AQ	•	•	3V	x=(F,E,C ⁶ ,B ⁶)	Now
	W25Q256FV/JVxxSQ	•	•	3V	x=(F,E,C ⁶ ,B ⁶)	Now
	W25H256JVxxJQ/BQ/AQ	•	•	3V	x=(F,E,C ⁶ ,B ⁶)	1Q-2018
	W25H256JVxxSQ	•	•	3V	x=(F,E,C ⁶ ,B ⁶)	1Q-2018
512M-bit	W25H512JVxxJQ/BQ/AQ	•	•	3V	x=(F,E,C ⁶ ,B ⁶)	3Q-2018
	W25M512JVxxJQ/BQ/AQ	•	•	3V	x=(F,E,C ⁶ ,B ⁶)	4Q-2017
	W25M512JVxxSQ	•	•	3V	x=(F,E,C ⁶ ,B ⁶)	1Q-2018
	W25M513JVxxJQ/BQ/AQ	•	•	3V	x=(F,E,C ⁶ ,B ⁶)	1Q-2018
	W25M513JVxxSQ	•	•	3V	x=(F,E,C ⁶ ,B ⁶)	1Q-2018
1G-bit NAND	W29N01HVxxJNA/BNA/ANA ¹¹			3V	x=(S,D,B ⁶)	Now
	W25N01GVxxJG/BG/AG ¹⁰	•	•	3V	x=(SF,ZE,TC ⁶ ,TB ⁶)	Now
	W29N01HZxxJNF/BNF/ANF ¹¹			1.8V	x=(S,D,B ⁶)	1Q-2018
	W25N01GWxxJG/BG/AG ¹⁰	•	•	1.8V	x=(ZE,TC ⁶ ,TB ⁶)	4Q-2017
2G-bit NAND	W29N02GVxxJAA/BAA/AAA ¹¹			3V	x=(S,B ⁶)	Now
	W25M02GVJG/BG/AG ¹⁰	•	•	3V	x=(ZE,TC ⁶ ,TB ⁶)	Now
	W29N02GZ/WxxJBA/BBA/ABA ¹¹			1.8V	x=(S,B ⁶)	1Q-2018
4G-bit NAND	W29N04GVxxJAA/BAA/AAA ¹¹			3V	x=(S,B ⁶)	3Q-2017
	W29N04GZ/WxxJBA/BBA/ABA ¹¹			1.8V	x=(S,B ⁶)	1Q-2018
8G-bit NAND	W29N08GVxxJAA/BAA/AAA ¹¹			3V	x=(S,B ⁶)	3Q-2017

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. See data sheet for details on Automotive product specifications. 4. Voltage 3V=2.7-3.6V, 1.8V=1.65-1.95V. 5. "Green" and RoHS compliant packaging. KGD Wafer also available. SN=S08 150mil, SS or S=S08 208mil, SF or F=SO16 300mil, ZP or P=WS08 6x5mm, ZE or EWSON8 8x6mm, UX=USON8 2x3mm, TC or C=TFBGA24 8x6mm (4X6 matrix), TB or B=TFBGA24 8x6mm (5X5 matrix). 6. Special Order. Contact Winbond for availability of products under development and special order products. 7. For W25Q32FV/64FV/128FV/256FV, and for W25Q16JV/32JV/64JV/128JV/256JV/512JV the AG1 (-40 to 125 Deg C - Part number ending with SG) parts will be available in 1Q'2018. 8. For W25Q16FW/32FW/64FW/128FW, the AG1 (-40 to 125 Deg C - Part number ending with SG) parts will be available in 3Q'2018. For W25Q16JV/32JV/64JV/128JV/256JV/512JV and W25Q16FW/32FW/64FW/128FW the AG2 and AG3 parts will be available in 4Q'2017. 9. The temperature grade for Industrial Grade Plus (JG/JQ) & AG2 (AG/AQ) is -40 TO +105Deg.C, temperature grade for AG3 (BG/BQ) is -40 to +85Deg. C. Temperature grade for AG1 (SG) is -40 to +125 Deg. C. 10. The last character in the part number for Serial NAND can be G or T. 11. For SLC NAND flash the packages offered are: S (TSOP48), D (VFBGA48) and B (VFBGA63).



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