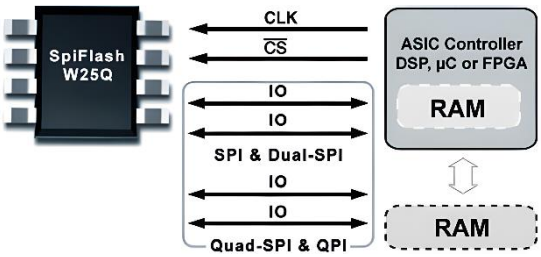
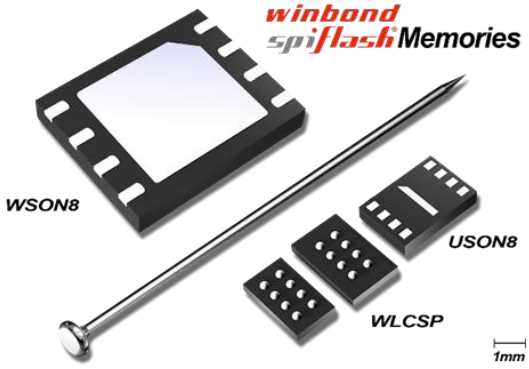
SpiFlash®

Serial Flash Memories

Winbond's W25Q SpiFlash® Multi-I/O memories utilize the popular Serial Peripheral Interface (SPI) and are available in densities ranging from 1Mb to 2Gb. These memories have small erasable sectors and offer industry-leading performance. The W25Q family with Dual-I/O and Quad-I/O SPI can deliver even higher eXecute-in-Place (XiP) performance especially when used in the Quad Peripheral Interface (QPI) mode where command, address and data all operate using Quad IO at clock rates up to 104MHz in DTR (Double Transfer Rate) mode achieving a transfer rate of 104MB/s . Faster transfer rates improve boot time and support faster shadowing of code to RAM. New ultra-small form-factor packages are also ideal for space-constrained mobile and handheld applications. Winbond, a leading provider of memory solutions, not only offers a complete range of densities but also ensures longevity support from its own fab, assuring the continuity of high-quality supply.





W25Q SpiFlash® Family

- 1Mb to 2Gb
- SPI, Dual-SPI, Quad-SPI and QPI
- Uniform 4KB, 32KB & 64KB erase
- Erase and Program Suspend/Resume
- Quad Page Program
- Security features including Lock-down, unique IDs, and one-time-program registers

Features

Wide Range of Applications

- Desktop PC, Notebook, PC Peripheral Memory, Server, Hard Disk Drive, Printer
- Bluetooth, True Wireless Stereo, Smart Home, Musical Instrument, Game
- 5G, Wifi, XDSL, Surveillance Camera, Gigabit Passive Optical Network, Switch
- Advanced Driving Assistance Systems, Vehicle-to-Everything, Car-AV, Domain Controller, Infotainment, Cluster

Voltage & Package Options

- 3V (2.7~3.6V), 2.5V (2.3~3.6V) and 1.8V (1.65~1.95V)
- Space saving packages including 8-pin SOP, WSON, VSOP, USON, WLCSP, 16-pin SOP, 24-ball TFBGA
- Known Good Die (KGD)

High Performance

- 166MHz Clock Rate, Dual/Quad-SPI/QPI
- Fast-boot with XIP code execution

Winbond SpiFlash® Memory Selection Guide [1,2,3]

Density	Winbond Part # [2]	Quad SPI	Clock MHz	Features [3]	Voltage	Package [4]
2G-bit	W25Q02JVxxIM	•	133	SPI / Quad / DTR / ECC	3V	xx=(TB[6])
	W25Q02NWxxIM	•	133	SPI / Quad / DTR	1.8V	xx=(SF,TB[6])
1G-bit	W25Q01JVxxIM/Q	•	133	SPI / Quad / DTR	3V	xx=(SF,ZE,TB[6])
	W25Q01NWxxIM/Q	•	133	SPI / Quad / DTR	1.8V	xx=(SF,ZE,TB[6])
512M-bit	W25Q512JVxIM/Q	•	133	SPI / Quad / DTR	3V	x=(F,E,B)
	W25Q512NWxIM/Q	•	133/166	SPI / Quad / DTR	1.8V	x=(F,E,B)
256M-bit	W25Q25PYxxIM/Q	•	133	SPI / Quad / DTR / 1.2V I/O	1.8V	xx=(SF[6],ZN,TB)
	W25Q25PWxxIM/Q	•	166	SPI / Quad / DTR	1.8V	xx=(SS,ZP,ZE,XG[6],TB[6],BY[6])
	W25Q256JVxIM/Q	•	133	SPI / Quad / DTR	3V	x=(F,E,C[6],B[6])
	W25Q256JWxIM/Q	•	133	SPI / Quad / DTR	1.8V	x=(F,E,C[6],P,B[6],Y[6])
128M-bit	W25Q128JVxIM/Q	•	133	SPI / Quad / DTR	3V	x=(S,F,P,E,C[6],B[6],Y[6])
	W25Q128JWxIM/Q	•	133	SPI / Quad / DTR	1.8V	x=(S,F,P,E,C[6],B[6],Y[6])
	W25Q12PWxxIM/Q/H	•	166	SPI / Quad / DTR	1.8V	xx=(SS,SF,ZP,ZE,UU,XG[6],BY,TB[6])
64M-bit	W25Q64PWxxIM/Q	•	166	SPI / Quad / DTR	1.8V	xx=(SN,SS,SF,UX,UU,ZP,XG[6],TB[6],BY[6])
	W25Q64JVxxIM/Q	•	133	SPI / Quad / DTR	3V	xx=(SS,SF,ZP,ZE, XG[6],TC[6],TB[6])
	W25Q64JWxxIM/Q	•	133	SPI / Quad / DTR	1.8V	xx=(SS,ZP,ZE,UU,XG[6],TB[6],BY[6])
32M-bit	W25Q33PWxxIM/Q	•	166	SPI / Quad / DTR	1.8V	xx=(SN,SS,ZP,XH,UU,BY[6])
	W25Q32RVxxJM/Q	•	133	SPI / Quad / DTR	3V	xx=(SN,SS,ZP,XH)
	W25Q32RLxxJM/Q	•	133	SPI / Quad / DTR	2.3V-3.6V	xx=(SN,SS,ZP,XH)
	W25Q32JWxxIM/Q	•	133	SPI / Quad / DTR	1.8V	xx=(SN,SS,ZP,UU[6],XG[6],TC[6],TB[6], BY[6])

Winbond SpiFlash® Memory Selection Guide [1,2,3]

Density	Winbond Part # [2]	Quad SPI	Clock MHz	Features [3]	Voltage	Package [4]
16M-bit	W25Q16PWxxIM/Q	•	166	SPI / Quad / DTR	1.8V	xx=(SN,SS,ZP,XH,UU,BY[6])
	W25Q16RVxxJM/Q	•	133	SPI / Quad / DTR	3V	xx=(SN,SS,ZP,XH)
	W25Q16RLxxJM/Q	•	133	SPI / Quad / DTR	2.3V-3.6V	xx=(SN,SS,ZP,XH)
	W25Q16JLxxIG	•	104	SPI / Quad	2.3V-3.6V	xx=(SN,UX,SS,ZP)
	W25Q16JWxxIM/Q	•	133	SPI / Quad / DTR	1.8V	xx=(SN,SS,ZP,XH,UU,BY[6])
8M-bit	W25Q80PWxxIM/Q	•	166	SPI / Quad / DTR	1.8V	xx=(SN,SS,ZP,ZT,XH,UU,BY[6])
	W25Q80RVxxJM/Q[7]	•	133	SPI / Quad / DTR	3V	xx=(SN,SS,ZP,XH)
	W25Q80RLxxJM/Q	•	133	SPI / Quad / DTR	2.3V-3.6V	xx=(SN,SS,ZP,XH)
4M-bit	W25Q40RVxxJM/Q	•	133	SPI / Quad / DTR	3V	xx=(SN,SS,ZP,XH)
	W25Q40RLxxJM/Q	•	133	SPI / Quad / DTR	2.3V-3.6V	xx=(SN,SS,ZP,XH)
	W25Q40EWxxIG/E[7]	•	104	SPI	1.8V	xx=(SN,SS,UX,BY[6])
2M-bit	W25Q20RLxxJM/Q	•	104	SPI / Quad / DTR	2.3V-3.6V	xx=(SN,SS,XH)
	W25Q20EWxxIG/E[7]	•	104	SPI	1.8V	xx=(SN,UX,BY[6])
1M-bit	W25Q10RLxxJM/Q	•	104	SPI / Quad / DTR	2.3V-3.6V	xx=(SN,SS,XH)
	W25Q10EWxxIG/E[7]	•	104	SPI	1.8V	xx=(SN,UX,BY[6])

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=SFDP1, 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, ZT=XSON8 1.5x1.5mm, 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.

winbond

Winbond Electronics Corporation
No. 8, Keya 1st Rd., Daya Dist.,
Taichung City 428303, Taiwan
Tel: 886-4-25218168
Email: mkt_online@winbond.com

Winbond Electronics Corporation America
2727 North First Street,
San Jose, CA 95134, U.S.A.
Tel: 1-408-943-6666

www.winbond.com

Version: Feb, 2025