

winbond

We Deliver



2013 **PRODUCT SELECTION GUIDE**

| Mobile RAM | Specialty DRAM | Flash Memory |

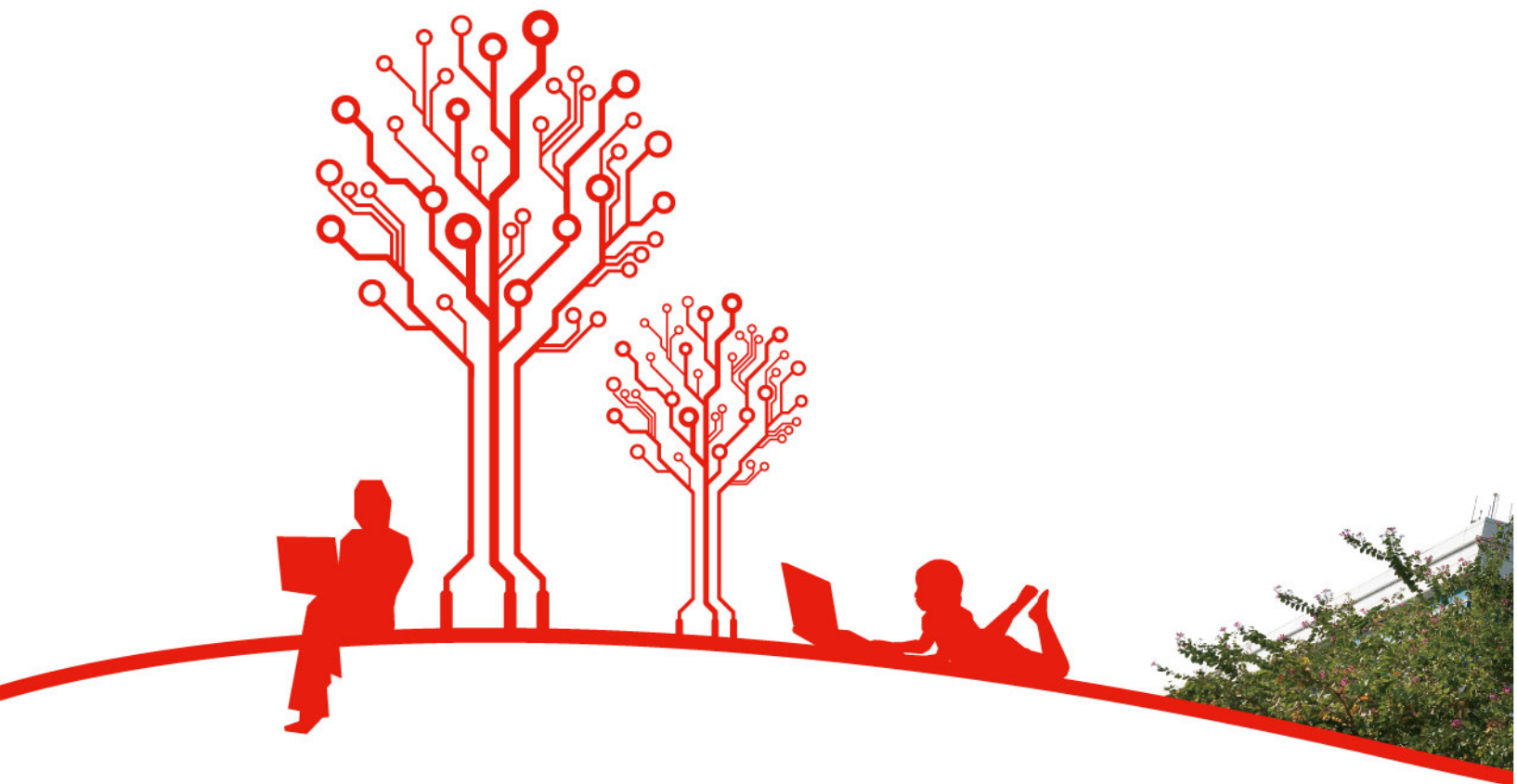




Winbond Electronics Corporation is a worldwide leading supplier of specialty memory. The Company provides total solution for low to medium density memory products backed by the expert capabilities of design, manufacturing and sales services.

Winbond owns three main business groups: DRAM Product, NOR Flash and Memory IC Manufacturing. Winbond's product portfolio, consisting of Mobile RAM, Specialty DRAM and low/medium-density NOR Flash, is widely used by leaders in the consumer, communication, computer peripheral and automotive markets. Based on a 300 mm wafer fab, Winbond keeps pace with the latest technologies to provide high-quality memory IC manufacturing services.

Winbond headquarters in Central Taiwan Science Park, Taiwan, and also has subsidiaries in America, Japan, China and Hong Kong.



2013 PRODUCT SELECTION GUIDE

CONTENTS

Mobile RAM

- 03 Low Power SDR SDRAM
- 05 Low Power DDR SDRAM
- 06 Low Power DDR2 SDRAM
- 07 Pseudo SRAM (KGD)

Specialty DRAM

- 09 SDRAM
- 12 DDR SDRAM
- 13 DDR2 SDRAM
- 15 DDR3 SDRAM
- 16 KGD

Flash Memory

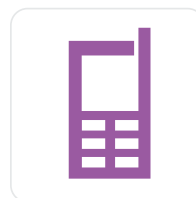
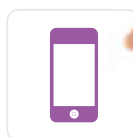
- 17 Serial Flash
- 27 Parallel Flash
- 28 NAND Flash
- 28 KGD



Mobile RAM

- Low Power SDR SDRAM
- Low Power DDR SDRAM
- Low Power DDR2 SDRAM
- Pseudo SRAM (KGD)

* The products listed above may not be available for all regions. Please contact your local Winbond Sales Representative.



Low Power SDR SDRAM

Winbond's LPDDR SDRAM (Low Power SDR SDRAM) product family is designed with specific features to reduce power consumption, including Partial Array Self Refresh (PASR), Auto Temperature Compensated Self Refresh (ATCSR), Power down mode, Deep power down mode and Programmable output buffer driving strength.

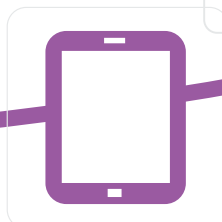
Note: If any request of KGD, please contact sales.

Low Power SDR SDRAM

Part No.	Density	Organization	Voltage	Speed Grade	Package	Status ^{1,2}	Automotive
W987D6HBGX	7E	128 Mbit	1.8V / 1.8V	133MHz, -25 to 85C	54VFBGA	P	-
	6E			166MHz, -25 to 85C			
	6I			166MHz, -40 to 85C			
W987D2HBJX	7E	X32	1.8V / 1.8V	133MHz, -25 to 85C	90VFBGA	P	-
	6E			166MHz, -25 to 85C			
	6I			166MHz, -40 to 85C			
W988D6FBGX	7E	256 Mbit	1.8V / 1.8V	133MHz, -25 to 85C	54VFBGA	P	-
	6E			166MHz, -25 to 85C			
	6I			166MHz, -40 to 85C			
W988D2FBJX	7E	X32	1.8V / 1.8V	133MHz, -25 to 85C	90VFBGA	P	-
	6E			166MHz, -25 to 85C			
	6I			166MHz, -40 to 85C			
W989D6CBGX	7E	512 Mbit	1.8V / 1.8V	133MHz, -25 to 85C	54VFBGA	P	P
	6E			166MHz, -25 to 85C			
	6I			166MHz, -40 to 85C			
W989D2CBJX	7E	X32	1.8V / 1.8V	133MHz, -25 to 85C	90VFBGA	P	UD
	6E			166MHz, -25 to 85C			
	6I			166MHz, -40 to 85C			
W989D6KBGX	6E	X16	1.8V / 1.8V	166MHz, -25 to 85C	60VFBGA	P	UD
	6I			166MHz, -40 to 85C			
	6E			166MHz, -25 to 85C			
W989D2KBJX	6E	X32	1.8V / 1.8V	166MHz, -25 to 85C	90VFBGA	P	UD
	6I			166MHz, -40 to 85C			
	6E			166MHz, -25 to 85C			

Status¹: P= Mass Production, S (Time)= Samples (Ready Time), UD (Time)= Under Development (Ready Time), N= Not recommended for new designs
RoHS²: All Winbond products are "Green", Halogen-Free and RoHS compliant packaging. Refer to the datasheet for details and specifications.

Contact us: LPDRAM@winbond.com



Mobile RAM

Low Power DDR SDRAM

Winbond's LPDDR SDRAM (Low Power DDR SDRAM) product family is designed with specific features to reduce power consumption, including Partial Array Self Refresh (PASR), Auto Temperature Compensated Self Refresh (ATCSR), Power down mode, Deep power down mode and Programmable output buffer driving strength.

Note: If any request of KGD, please contact sales.

Low Power DDR SDRAM

Part No.		Density	Organization	Voltage	Speed Grade	Package	Status ^{1,2}	Automotive
W947D6HBHX	6E	128 Mbit	x16	1.8V / 1.8V	166MHz, -25 to 85C	60VFBGA	P	-
	5E				200MHz, -25 to 85C			
	6I				166MHz, -40 to 85C			
	5I				200MHz, -40 to 85C			
W947D2HBXJ	6E		x32		166MHz, -25 to 85C	90VFBGA		
	5E				200MHz, -25 to 85C			
	6I				166MHz, -40 to 85C			
	5I				200MHz, -40 to 85C			
W948D6FBHX	6E	256 Mbit	x16	1.8V / 1.8V	166MHz, -25 to 85C	60VFBGA	P	-
	5E				200MHz, -25 to 85C			
	6I				166MHz, -40 to 85C			
	5I				200MHz, -40 to 85C			
W948D2FBXJ	6E		x32		166MHz, -25 to 85C	90VFBGA		
	5E				200MHz, -25 to 85C			
	6I				166MHz, -40 to 85C			
	5I				200MHz, -40 to 85C			
W949D6CBHX	6E	512 Mbit	x16	1.8V / 1.8V	166MHz, -25 to 85C	60VFBGA	P	P
	5E				200MHz, -25 to 85C			
	6I				166MHz, -40 to 85C			
	5I				200MHz, -40 to 85C			
W949D2CBXJ	6E		x32		166MHz, -25 to 85C	90VFBGA		
	5E				200MHz, -25 to 85C			
	6I				166MHz, -40 to 85C			
	5I				200MHz, -40 to 85C			
W949D6KBHX	5E	512 Mbit	X16	1.8V / 1.8V	200MHz, -25 to 85C	60VFBGA	P	UD
	5I				200MHz, -40 to 85C			
W949D2KBXJ	5E		X32		200MHz, -25 to 85C	90VFBGA		
	5I				200MHz, -40 to 85C			
W94AD6KBHX	5E	1Gbit	X16	1.8V / 1.8V	200MHz, -25 to 85C	60VFBGA	UD(Q1/'13)	UD
	5I				200MHz, -40 to 85C			
W94AD2KBXJ	5E		X32		200MHz, -25 to 85C	90VFBGA		
	5I				200MHz, -40 to 85C			

Status¹: P= Mass Production, S (Time)= Samples (Ready Time), UD (Time)= Under Development (Ready Time), N= Not recommended for new designs
 RoHS²: All Winbond products are "Green", Halogen-Free and RoHS compliant packaging. Refer to the datasheet for details and specifications.

Contact us: LPDRAM@winbond.com



Low Power DDR2 SDRAM

Winbond's LPDDR2 SDRAM(Low Power DDR2 SDRAM) product family is designed with specific features to reduce power consumption, including Partial Array Self Refresh (PASR), Auto Temperature Compensated Self Refresh (ATCSR), Power down mode, Deep power down mode and Programmable output buffer driving strength.

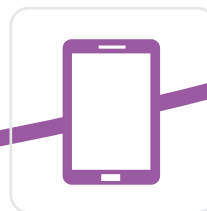
Note: If any request of KGD, please contact sales.

Low Power DDR2 SDRAM

Part No.		Density	Organization	Voltage	Speed Grade	Package	Status ^{1,2}	Automotive
W979H6KBQX	3I	512 Mbit	x16	1.8V / 1.2V / 1.2V	333MHz, -40 to 85C	168 PoP	UD(Q1/'13)	UD
	2I				400MHz, -40 to 85C			
W979H2KBQX	3I		x32		333MHz, -40 to 85C	168 PoP		
	2I				400MHz, -40 to 85C			
W97AH6KBQX	3I	1Gbit	x16		333MHz, -40 to 85C	168 PoP	UD(Q2/'13)	UD
	2I				400MHz, -40 to 85C			
W97AH2KBQX	3I		x32		333MHz, -40 to 85C	168 PoP		
	2I				400MHz, -40 to 85C			
W97BH6KBQX	3I	2Gbit	x16	333MHz, -40 to 85C	168 PoP	UD(Q1/'13)	UD	
	2I			400MHz, -40 to 85C				
W97BH2KBQX	3I		x32	333MHz, -40 to 85C	168 PoP			
	2I			400MHz, -40 to 85C				

Status¹: P= Mass Production, S (Time)= Samples (Ready Time), UD (Time)= Under Development (Ready Time), N= Not recommended for new designs
RoHS²: All Winbond products are "Green", Halogen-Free and RoHS compliant packaging. Refer to the datasheet for details and specifications.

Contact us: LPDRAM@winbond.com



Mobile RAM

Pseudo SRAM (KGD)

Pseudo SRAM (Static Random Access Memory) consists of a DRAM macro core with a traditional SRAM interface; an on-chip refresh circuit that frees the user from the need to take care of this task. Comparing to traditional CMOS SRAM, PSRAM has advantage in higher density, higher speed, smaller die size, and DRAM compatible process.

Pseudo SRAM (KGD)

Part No.	Density	Organization	Voltage	Speed Grade	Package	Status ^{1,2}	Automotive
W965D6GKA	32 Mbit	X16 CRAM	1.8V / 1.8V	133MHz / 70ns, -25 to 85C	-	P	-
W955D6GKA		X16 CRAM-ADM	1.8V / 1.8V		-	P	-
W955D6GKS		X16 CRAM-AADM	1.8V / 1.8V		-	P	-
W966D6HKA	64 Mbit	X16 CRAM	1.8V / 1.8V	133MHz / 70ns, -25 to 85C	-	P	-
W956D6HKA		X16 CRAM-ADM	1.8V / 1.8V		-	P	-
W956D6HKS		X16 CRAM-AADM	1.8V / 1.8V		-	P	-
W956D6KKA		X16 CRAM-ADM	1.8V / 1.8V		-	P	-
W956D6KKS		X16 CRAM-AADM	1.8V / 1.8V		-	P	-
W956D6KKE		X16 CRAM-ADM_DDR	1.8V / 1.8V		-	P	-
W956D6KKW		X16 CRAM-AADM_DDR	1.8V / 1.8V		-	P	-
W967D6HKA	128 Mbit	X16 CRAM	1.8V / 1.8V	133MHz / 70ns, -25 to 85C	-	P	-
W957D6HKA		X16 CRAM-ADM			-	P	-
W957D6HKS		X16 CRAM-AADM			-	P	-
W968D6DKA	256Mbit	X16 CRAM	1.8V / 1.8V	133MHz / 70ns, -25 to 85C	-	P	-
W958D6DKA		X16 CRAM-ADM			-	P	-
W958D6DKS		X16 CRAM-AADM			-	P	-

Status¹: P= Mass Production, S (Time)= Samples (Ready Time), UD (Time)= Under Development (Ready Time), N= Not recommended for new designs
RoHS²: All Winbond products are "Green", Halogen-Free and RoHS compliant packaging. Refer to the datasheet for details and specifications.

Contact us: PSRAM@winbond.com



winbond

We Deliver



擔當

創新

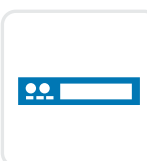
群效

Accountability / Innovation / Teamwork

Specialty DRAM

- SDRAM
- DDR SDRAM
- DDR2 SDRAM
- DDR3 SDRAM
- KGD

• The products listed above may not be available for all regions. Please contact your local Winbond Sales Representative.



SDRAM

Synchronous DRAM is designed to process data at the same clock speed as the CPU. Therefore, synchronous DRAM is regarded as the core component that is used in high speed processing of large volumes of data. Currently, its usage is expanding to various consumer electronics such as DTV, DSC, HDD and STB.

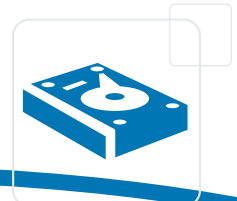
16Mb SDRAM

Part No.	Organization		Voltage	Speed Grade			Package	Status ^{1,2}	Automotive
W9816G6IB	1Mbit x16	2 Banks	3.3V±0.3V	-6/-6I	166 MHz	CL3	VFBGA 60 Ball, RoHS compliant	P	P
			2.7V~3.6V	-7	143 MHz				
W9816G6IH	1Mbit x16	2 Banks	3.3V±0.3V	-5	143 MHz	CL2	TSOP II 50-pin, 400 mil, RoHS compliant	P	P
					200 MHz	CL3			
			3.3V±0.3V	-6/-6I/-6A	166 MHz				
			2.7V~3.6V	-7/-7I	143 MHz				

64Mb SDRAM

Part No.	Organization		Voltage	Speed Grade			Package	Status ^{1,2}	Automotive
W9864G2JB	2Mbit x32	4 Banks	3.3V±0.3V	-6/-6I/-6K/-6A	166 MHz	CL3	TFBGA 90 Ball (8x13mm ²), RoHS compliant	P	P
			2.7V~3.6V	-7/-7I	143 MHz				
W9864G2JH	2Mbit x32	4 Banks	3.3V±0.3V	-5	200 MHz	CL3	TSOP II 86-pin, RoHS compliant	P	P
				-6/-6I/-6A	166 MHz				
			2.7V~3.6V	-7	143 MHz				
W9864G6JH	4Mbit x16	4 Banks	3.3V±0.3V	-5	200 MHz	CL3	TSOP II 54-pin, 400 mil, RoHS compliant	P	P
				-6/-6I/-6A	166 MHz				
			2.7V~3.6V	-7/-7S	143 MHz				
W9864G6JB	4Mbit x16	4 Banks	3.3V±0.3V	-6/-6I/-6A	166 MHz	CL3	VFBGA 60 Ball, RoHS compliant	P	P
			2.7V~3.6V	-7	143 MHz				
W9864G6JT	4Mbit x16	4 Banks	3.3V±0.3V	-6/-6I/-6A/-6K	166 MHz	CL3	TFBGA 54 Ball, RoHS compliant	P	P

Status¹: P= Mass Production, S (Time)= Samples (Ready Time), UD (Time)= Under Development (Ready Time), N= Not recommended for new designs
RoHS²: All Winbond products are "Green", Halogen-Free and RoHS compliant packaging. Refer to the datasheet for details and specifications.



Specialty DRAM

128Mb SDRAM

Part No.	Organization		Voltage	Speed Grade			Package	Status ^{1,2}	Automotive
W9812G6JH	8Mbit x16	4 Banks	3.3V±0.3V	-5	200 MHz	CL3	TSOP II 54-pin, 400 mil, RoHS compliant	P	P
				-6/-6I/-6A	166 MHz				
				-75	133 MHz				
W9812G6JB	8Mbit x16	4 Banks	3.3V±0.3V	-6/-6I	166 MHz	CL3	TFBGA 54 Ball (8x8mm ²), RoHS compliant	P	P
				-75/75I	133 MHz				

256Mb SDRAM

Part No.	Organization		Voltage	Speed Grade			Package	Status ^{1,2}	Automotive
W9825G2JB	8Mbit x32	4 Banks	3.3V±0.3V	-6	166 MHz	CL3	TFBGA 90 Ball, ROHS compliant	P	P
			2.7V~3.6V	-6I					
				-75/75I	133 MHz				
W9825G6JH	16Mbit x16	4 Banks	3.3V±0.3V	-5	200 MHz	CL3	TSOP II 54-pin, 400 mil - 0.80, RoHS compliant	P	P
				-6/-6I/-6L/-6A	166 MHz				
				-6	133 MHz	CL2			
				-75/75L		CL3			
W9825G6JB	16Mbit x16	4 Banks	3.3V±0.3V	-6/-6I/-6A/-6K	166 MHz	CL3	TFBGA 54 Ball (8x8mm ²), RoHS compliant	P	P
				-75	133 MHz				

Status¹: P= Mass Production, S (Time)= Samples (Ready Time), UD (Time)= Under Development (Ready Time), N= Not recommended for new designs'
 RoHS²: All Winbond products are "Green", Halogen-Free and RoHS compliant packaging. Refer to the datasheet for details and specifications.

Winbond also provides Automotive DRAM.
 Contact us: SDRAM@winbond.com



DDR SDRAM

DDR SDRAM or double-data-rate synchronous dynamic random access memory is a type of memory used in computers and consumer electronics. It achieves greater bandwidth than the preceding single-data-rate SDRAM by transferring data on both the rising and falling edges of the clock signal.

64Mb DDR

Part No.	Organization		Voltage	Speed Grade			Package	Status ^{1,2}	Automotive
W9464G6JH	4Mbitx16	4 Banks	2.4V~2.7V	-4	250 MHz	CL3/CL4	TSOP II 66-pin, RoHS compliant	P	P
			2.5V±0.2V	-5/-5I	200 MHz	CL3			

128Mb DDR

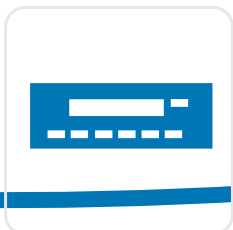
Part No.	Organization		Voltage	Speed Grade			Package	Status ^{1,2}	Automotive
W9412G6JH	8Mbitx16	4 Banks	2.4V~2.7V	-4	250 MHz	CL3/CL4	TSOP II 66-pin, RoHS compliant	P	P
			2.5V±0.2V	-5/-5I/-5K	200 MHz	CL3			
				-6I					
W9412G6JB	8Mbitx16	4 Banks	2.4V~2.7V	-4	250 MHz	CL3/CL4	TFBGA 60 Ball (8x13mm²), RoHS compliant	P	P
			2.5V±0.2V	-5/-5I	200 MHz	CL3			

256Mb DDR

Part No.	Organization		Voltage	Speed Grade			Package	Status ^{1,2}	Automotive
W9425G6JH	16Mbitx16	4 Banks	2.4V~2.7V	-4	250 MHz	CL3/CL4	TSOP II 66-pin, RoHS compliant	P	P
			2.5V ±0.2V	-5/-5I/-5A	200 MHz	CL3			
W9425G6JB	16Mbitx16	4 Banks	2.5V ±0.2V	-5/-5I	200MHz	CL3	TFBGA 60 Ball, RoHS compliant	P	P

Status¹: P= Mass Production, S (Time)= Samples (Ready Time), UD (Time)= Under Development (Ready Time), N= Not recommended for new designs
RoHS²: All Winbond products are "Green", Halogen-Free and RoHS compliant packaging. Refer to the datasheet for details and specifications.

Winbond also provides Automotive DRAM.
Contact us: SDRAM@winbond.com



Specialty DRAM

DDR2 SDRAM

DDR2 SDRAM (double-data-rate synchronous dynamic random access memory generation 2) is a type of memory used in computers and consumer electronics. It achieves greater bandwidth than the preceding DDR SDRAM by higher clock rate

128Mb DDR2

Part No.	Organization		Voltage	Speed Grade		CL-tRCD-tRP	Package	Status ^{1,2}	Automotive
W9712G6KB W9712G6KT	8Mbit x16	4 Banks	1.8V±0.1V	-18	DDR2-1066	7-7-7	TFBGA 84 Ball (8x12.5mm ²), RoHS compliant	P	P
				-25	DDR2-800	5-5-5/6-6-6			
				-3	DDR2-667	5-5-5			
W9712G8JB	16Mbitx8	4 Banks	1.8V±0.1V	-18	DDR2-1066	7-7-7	WBGA 60 Ball (8x12.5mm ²), RoHS compliant	P	P
				-25	DDR2-800	5-5-5/6-6-6			
				-3	DDR2-667	5-5-5			

256Mb DDR2

Part No.	Organization		Voltage	Speed Grade		CL-tRCD-tRP	Package	Status ^{1,2}	Automotive
W9725G2JB	8Mbit x32	4 Banks	1.8V±0.1V	-25	DDR2-800	5-5-5/6-6-6	TFBGA 128 Ball(10.5X13.5 mm ²), RoHS compliant	P	P
				-3	DDR2-667	5-5-5			
W9725G6KB W9725G6KT	16Mbit x16	4 Banks	1.8V±0.1V	-18	DDR2-1066	7-7-7	WBGA 84 Ball (8X12.5 mm ²), RoHS compliant	P	P
				-25/25I/25A/25K	DDR2-800	5-5-5/6-6-6			
				-3	DDR2-667	5-5-5			
W9725G8KB	32Mbitx8	4 Banks	1.8V±0.1V	-18	DDR2-1066	7-7-7	WBGA 60 Ball (8X12.5 mm ²), RoHS compliant	P	P
				-25	DDR2-800	5-5-5/6-6-6			
				-3	DDR2-667	5-5-5			

Status¹: P= Mass Production, S (Time)= Samples (Ready Time), UD (Time)= Under Development (Ready Time), N= Not recommended for new designs
RoHS²: All Winbond products are "Green", Halogen-Free and RoHS compliant packaging. Refer to the datasheet for details and specifications.



512Mb DDR2

Part No.	Organization		Voltage	Speed Grade		CL-tRCD-tRP	Package	Status ^{1,2}	Automotive
W9751G6KB	32Mbitx16	4 Banks	1.8V±0.1V	-18	DDR2-1066	7-7-7	WBGA 84 Ball (8X12.5 mm ²), RoHS compliant	P	P
				-25/25I/ 25A/25K	DDR2-800	5-5-5/6-6-6			
				-3	DDR2-667	5-5-5			
W9751G8KB	64Mbitx8	4 Banks	1.8V±0.1V	-18	DDR2-1066	7-7-7	WBGA 60 Ball (8X12.5 mm ²), RoHS compliant	P	P
				-25/25I	DDR2-800	5-5-5/6-6-6			
				-3	DDR2-667	5-5-5			

1Gb DDR2

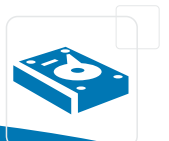
Part No.	Organization		Voltage	Speed Grade		CL-tRCD-tRP	Package	Status ^{1,2}	Automotive
W971GG6KB	64Mbitx16	8 Banks	1.8V±0.1V	-18	DDR2-1066	6-6-6	WBGA 84 Ball (8x12.5mm ²), RoHS compliant	P	P
				-25/25I/ 25L/25A/ 25K	DDR2-800	5-5-5			
				-3	DDR2-667	5-5-5			
W971GG8KB	128Mbitx8	8 Banks	1.8V±0.1V	-18	DDR2-1066	6-6-6	WBGA 60 Ball (8x12.5mm ²), RoHS compliant	P	P
				-25/25I/ 25A/25K	DDR2-800	5-5-5			
				-3	DDR2-667	5-5-5			

2Gb DDR2

Part No.	Organization		Voltage	Speed Grade		CL-tRCD-tRP	Package	Status ^{1,2}	Automotive
W972GG6JB	128Mbitx16	8 Banks	1.8V±0.1V	-18	DDR2-1066	7-7-7	WBGA 84 Ball (11x13mm ²), RoHS compliant	P	P
				-25/25I/ 25A/25K	DDR2-800	5-5-5/6-6-6			
				-3/-3A	DDR2-667	5-5-5			
W972GG8JB	256Mbitx8	8 Banks	1.8V±0.1V	-18	DDR2-1066	7-7-7	WBGA 60 Ball (11x11.5mm ²), RoHS compliant	P	P
				-25/25I	DDR2-800	5-5-5/6-6-6			
				-3	DDR2-667	5-5-5			

Status¹: P= Mass Production, S (Time)= Samples (Ready Time), UD (Time)= Under Development (Ready Time), N= Not recommended for new designs
RoHS²: All Winbond products are "Green", Halogen-Free and RoHS compliant packaging. Refer to the datasheet for details and specifications.

Winbond also provides Automotive DRAM.
Contact us: SDRAM@winbond.com



Specialty DRAM

DDR3 SDRAM

DDR3 SDRAM (double-data-rate synchronous dynamic random access memory generation 3) is a type of memory used in electronics. Such as TV, STB, Network, BD-Player and so on.

It achieves greater bandwidth than the preceding DDR2 SDRAM by higher clock rate.

1Gb DDR3

Part No.	Organization		Voltage	Speed Grade		CL-tRCD-tRP	Package	Status ^{1,2}	Automotive
W631GG6KB	64Mbitx16	8 Banks	1.5V±0.075V	-11	DDR3-1866	13-13-13	WBGA 96 Ball (9x13mm ²), RoHS compliant	P	P
				-12/12I/12A/12K	DDR3-1600	11-11-11			
				-15/15I/15A/15K	DDR3-1333	9-9-9			
W631GU6KB	64Mbitx16	8 Banks	1.283V ~1.45V	-15/15I/15A/15K	DDR3-1333	9-9-9	WBGA 96 Ball (9x13mm ²), RoHS compliant	P	P
W631GG8KB	128Mbitx8	8 Banks	1.5V±0.075V	-11	DDR3-1866	13-13-13	WBGA 78 Ball (8x10.5mm ²), RoHS compliant	P	P
				-12	DDR3-1600	11-11-11			
				-15/15I	DDR3-1333	9-9-9			
W631GU8KB	128Mbitx8	8 Banks	1.283V ~1.45V	-15/15I	DDR3-1333	9-9-9	WBGA 78 Ball (8x10.5mm ²), RoHS compliant	P	P

2Gb DDR3

Part No.	Organization		Voltage	Speed Grade		CL-tRCD-tRP	Package	Status ^{1,2}	Automotive
W632GG6KB	128Mbitx16	8 Banks	1.5V±0.075V	-11	DDR3-1866	13-13-13	WBGA 96 Ball (9x13mm ²), RoHS compliant	P	S
				-12/12I	DDR3-1600	11-11-11			
				-15/15I/15A/15K	DDR3-1333	9-9-9			
W632GU6KB	128Mbitx16	8 Banks	1.283V ~1.45V	-15/15I/15A/15K	DDR3-1333	9-9-9	WBGA 96 Ball (9x13mm ²), RoHS compliant	P	S
W632GG8KB	256Mbitx8	8 Banks	1.5V±0.075V	-11	DDR3-1866	13-13-13	WBGA 78 Ball (8x10.5mm ²), RoHS compliant	P	S
				-12	DDR3-1600	11-11-11			
				-15	DDR3-1333	9-9-9			
W632GU8KB	256Mbitx8	8 Banks	1.283V ~1.45V	-15	DDR3-1333	9-9-9	WBGA 78 Ball (8x10.5mm ²), RoHS compliant	P	S

Status¹: P= Mass Production, S (Time)= Samples (Ready Time), UD (Time)= Under Development (Ready Time), N= Not recommended for new designs
RoHS²: All Winbond products are "Green", Halogen-Free and RoHS compliant packaging. Refer to the datasheet for details and specifications.



4Gb DDR3

Part No.	Organization		Voltage	Speed Grade		CL-tRCD-tRP	Package	Status ^{1,2}	Automotive
W634GG6LB	256Mbitx16	8 Banks	1.5V±0.075V	-12	DDR3-1600	11-11-11	WBGA 96 Ball (9x13.5mm ²), RoHS compliant	P	-
				-15	DDR3-1333	9-9-9			
W634GU6LB	256Mbitx16	8 Banks	1.35V	-15	DDR3-1333	9-9-9	WBGA 96 Ball (9x13.5mm ²), RoHS compliant	P	-

1Gb GDDR3

Part No.	Density	Organization	Voltage	Speed Grade		Package	Status ^{1,2}	Automotive
W641GG2KB	1Gbit	32Mbit x32	1.8V ± 0.1V	-12/-14	1G/800/700MHz	WBGA-136	P	-

Status¹: P= Mass Production, S (Time)= Samples (Ready Time), UD (Time)= Under Development (Ready Time), N= Not recommended for new designs
RoHS²: All Winbond products are "Green", Halogen-Free and RoHS compliant packaging. Refer to the datasheet for details and specifications.

Winbond also provides Automotive DRAM.
Contact us: SDRAM@winbond.com

KGD

Fully Cover all Consumer Applications:

TV, STB, Networking, Storage, Printer, DSC/DV, GPS, Automotive...etc.
Providing KGD services to SiP customers with complete DRAM product portfolio such as SDRAM, DDR, DDR2, DDR3, mSDR, mDDR, mDDR2 and PSRAM.

Wafer Level high speed test:

Up to DDR3 1600Mbps, DDR2 1066Mbps, DDR 500Mbps.
Winbond provides professional advices to KGD customers, including SiP package bonding & power/thermal, DRAM simulation,...etc.

Excellent Quality Control:

100% Burn-In and Test.
AECQ-100, TS16949, ISO9001/14001, OHSAS18001 certificated for Automotive customers.

Product Life Time and Strong Engineering Support:

Owning a 12-inch Feb to guarantee stable long term support with EFA/PFA capability.

Contact us: DRAM-KGD@winbond.com



Flash Memory

- Serial Flash
- Parallel Flash
- NAND Flash
- KGD

• The products listed above may not be available for all regions. Please contact your local Winbond Sales Representative.



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 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. Additionally, new ultra-small form factor packages are ideal for space constrained mobile and handheld applications.

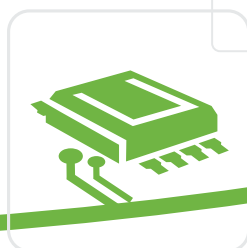
Leading the Serial Flash Market in unit sales and revenue, Winbond TS16949 certified AEC-Q100 qualified memories now support automotive applications. The automobile has transformed into the most sophisticated electronic device in the market. Digital displays in automotive dashboards provide more information 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 is 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.

Tiny Serial Flash Packages

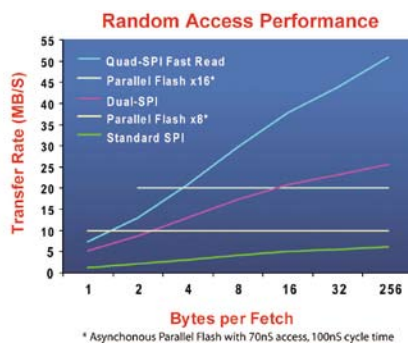
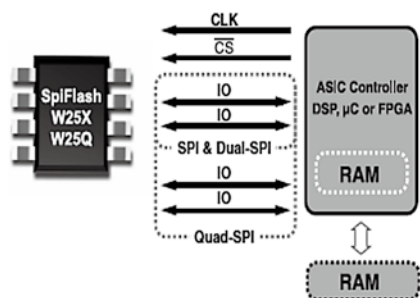


Winbond Industrial and Automotive Grade Memory

	Industrial	Industrial Plus	Automotive Grade 3	Automotive Grade 2
Temperature Range	-40°C~85°C	-40°C~105°C	-40°C~85°C	-40°C~105°C
Part# Example	W25Q80BVSSIG	W25Q80BVSSJG	W25Q80BVSSBG	W25Q80BVSSAG
AEC-Q100 Compliant	No	No	Yes	Yes
Change Control (PPAP)	No	No	Optional	Optional



Flash Memory



W25X SpiFlash Family

- Serial Peripheral Interface (SPI), Dual Output SPI
- Uniform 4KB, 32KB & 64KB erase

W25Q SpiFlash Family

- 512K-bit to 512M-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

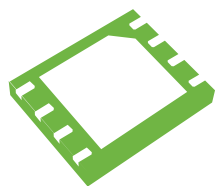
- 104MHz Clock, 416MHz Quad-SPI (50MB/S)
- >8X speed of most Serial Flash
- Fast-boot or execute code (XIP) from SPI

Voltage & Package Options

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

Wide Range of Applications

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



Serial Flash

SpiFlash W25X & W25Q Memory Overview & Selection Guide

Part No.	Density	Organization	Voltage	Temp.	Speed	Package(s)	Status ^{1,2}	Automotive
W25X05CL	512Kbit (64KB)	256 pages, 4KB sectors, 32/64KB blocks, Fast Write, Dual SPI	2.3V - 3.6V and 2.7V - 3.6V	-40 to +85	50/104MHz (208MHz Dual-SPI)	SOIC8 150mil, VSOP8 150mil, WSON 6X5mm ⁴ , USON8 2X3mm, TSSOP8 173mil	P	-
W25Q05CL ⁴	512Kbit (64KB)	256 pages, 4KB sectors, 32/64KB blocks, Fast Write, Dual/Quad SPI	2.3V - 3.6V and 2.7V - 3.6V	-40 to +85	104MHz (208/416MHz Dual/Quad-SPI)	SOIC8 150mil, VSOP8 150mil, WSON 6X5mm, USON8 2X3mm, TSSOP8 173mil	P	-
W25X10BV	1Mbit (128KB)	512 pages, 4KB sectors, 32/64KB blocks, Dual SPI	2.7V - 3.6V	-40 to +85	104MHz (208MHz Dual-SPI)	SOIC8 150mil, WSON 6X5mm ⁴ , VSOP8 150mil, USON8 2X3mm	N	-
W25X10CL	1Mbit (128KB)	512 pages, 4KB sectors, 32/64KB blocks, Fast Write, Dual SPI	2.3V - 3.6V and 2.7V - 3.6V	-40 to +85	50/104MHz (208MHz Dual-SPI)	SOIC8 150mil, VSOP8 150mil, WSON 6X5mm ⁴ , USON8 2X3mm, TSSOP8 173mil	P	-
W25Q10CL ⁴	1Mbit (128KB)	512 pages, 4KB sectors, 32/64KB blocks, Fast Write, Dual/Quad SPI	2.3V - 3.6V and 2.7V - 3.6V	-40 to +85	104MHz (208/416MHz Dual/Quad-SPI)	SOIC8 150mil, VSOP8 150mil, WSON 6X5mm, USON8 2X3mm, TSSOP8 173mil	P	-
W25X20BV	2Mbit (256KB)	1024 pages, 4KB sectors, 32/64KB blocks, Dual SPI	2.7V - 3.6V	-40 to +85	104MHz (208MHz Dual-SPI)	SOIC8 150mil, WSON 6X5mm, USON8 2X3mm	N	-
W25X20BL	2Mbit (256KB)	1024 pages, 4KB sectors, 32/64KB blocks, Dual SPI	2.3V - 3.6V	-40 to +85	50/104MHz (208MHz Dual-SPI)	SOIC8 150mil, WSON 6X5mm, VSOP8 150mil, USON8 2X3mm	N	-
W25X20CV (Automotive Only)	2Mbit (256KB)	1024 pages, 4KB sectors, 32/64KB blocks, Fast Write, Dual SPI	2.3V - 3.6V	-40 to +85 -40 to +105	50/104MHz (208MHz Dual-SPI)	SOIC8 150mil, WSON 6X5mm, SOIC8 208mil, USON8 2X3mm	-	P

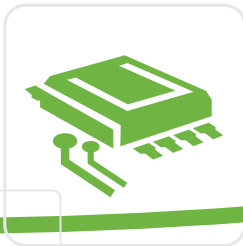
Status¹: P= Mass Production, S (Time)= Samples (Ready Time), UD (Time)= Under Development (Ready Time), N= Not recommended for new designs

RoHS²: All Winbond products are "Green", Halogen-Free and RoHS compliant packaging. Refer to the datasheet for details and specifications.

Enhanced³ = SFDP, Security Registers, Program/Erase Suspend/Resume, Word Read Quad I/O, Burst Read with Wrap, Non-Volatile & Volatile Registers, Complement Array Protection

W25Q05CL/10CL/20CL/40CL⁴: Please contact Winbond for availability of these products and the 6x5mm WSON package.

Contact us: SpiFlash@winbond.com



Flash Memory

Serial Flash

SpiFlash W25X & W25Q Memory Overview & Selection Guide

Part No.	Density	Organization	Voltage	Temp.	Speed	Package(s)	Status ^{1,2}	Automotive
W25X20CL	2Mbit (256KB)	1024 pages, 4KB sectors, 32/64KB blocks, Fast Write, Dual SPI	2.3V - 3.6V and 2.7V - 3.6V	-40 to +85	50/104MHz (208MHz Dual-SPI)	SOIC8 150mil, WSON 6X5mm, VSOP8 150mil, USON8 2X3mm	P	-
W25Q20CL ⁴	2Mbit (256KB)	1024 pages, 4KB sectors, 32/64KB blocks, Fast Write, Dual/Quad SPI	2.3V - 3.6V and 2.7V - 3.6V	-40 to +85	104MHz (208/416MHz Dual/ Quad-SPI)	SOIC8 150mil, WSON 6X5mm, VSOP8 150mil, USON8 2X3mm	P	-
W25Q20BW	2Mbit (256KB)	1024 pages, 4KB sectors, 32/64KB blocks, Dual/Quad SPI, Fast Write, Enhanced ³	1.65V - 1.95V	-40 to +85	80MHz (160/320MHz Dual/ Quad-SPI)	SOIC8 150mil, WSON 6X5mm, VSOP8 150mil, USON8 2X3mm	P	-
W25X40BV	4Mbit (512KB)	2048 pages, 4KB sectors, 32/64KB blocks, Dual SPI	2.7V - 3.6V	-40 to +85	80/104MHz (208MHz Dual-SPI)	SOIC8 150mil, SOIC8 208mil, WSON 6X5mm, PDIP8 300mil, VSOP8 150mil, USON8 2X3mm	N	-
W25X40BL	4Mbit (512KB)	2048 pages, 4KB sectors, 32/64KB blocks, Dual SPI	2.3V - 3.6V	-40 to +85	50/104MHz (208MHz Dual-SPI)	SOIC8 150mil, SOIC8 208mil, WSON 6X5mm, PDIP8 300mil, VSOP8 150mil, USON8 2X3mm	N	-
W25X40CV (Automotive Only)	4Mbit (512KB)	2048 pages, 4KB sectors, 32/64KB blocks, Fast Write, Dual SPI	2.7V - 3.6V	-40 to +85 -40 to +105	50/104MHz (208MHz Dual-SPI)	SOIC8 150mil, WSON 6X5mm, SOIC8 208mil, USON8 2X3mm	-	P
W25X40CL	4Mbit (512KB)	2048 pages, 4KB sectors, 32/64KB blocks, Fast Write, Dual SPI	2.3V - 3.6V and 2.7V - 3.6V	-40 to +85	50/104MHz (208MHz Dual-SPI)	SOIC8 150mil, SOIC8 208mil, WSON 6X5mm, PDIP8 300mil, VSOP8 150mil, USON8 2X3mm	P	-
W25Q40BV	4Mbit (512KB)	2048 pages, 4KB sectors, 32/64KB blocks, Dual/Quad-SPI Enhanced ³	2.7V - 3.6V	-40 to +85	80/104MHz (160/320MHzDual/ Quad-SPI)	SOIC8 150mil, SOIC8 208mil, WSON 6X5mm, PDIP8 300mil, VSOP8 150mil, USON8 2X3mm	N	-

Status¹: P= Mass Production, S (Time)= Samples (Ready Time), UD (Time)= Under Development (Ready Time), N= Not recommended for new designs
RoHS²: All Winbond products are "Green", Halogen-Free and RoHS compliant packaging. Refer to the datasheet for details and specifications.

Enhanced³ = SFDP, Security Registers, Program/Erase Suspend/Resume, Word Read Quad I/O, Burst Read with Wrap, Non-Volatile & Volatile Registers, Complement Array Protection

W25Q05CL/10CL/20CL/40CL⁴: Please contact Winbond for availability of these products and the 6x5mm WSON package.

Contact us: SpiFlash@winbond.com



Serial Flash

SpiFlash W25X & W25Q Memory Overview & Selection Guide

Part No.	Density	Organization	Voltage	Temp.	Speed	Package(s)	Status ^{1,2}	Automotive
W25Q40BL	4Mbit (512KB)	2048 pages, 4KB sectors, 32/64KB blocks, Dual/Quad SPI, Fast Write, Enhanced ³	2.3V - 3.6V	-40 to +85	50/80MHz (100/200MHz Dual/ Quad-SPI)	SOIC8 150mil, SOIC8 208mil, WSON 6X5mm, PDIP8 300mil, VSOP8 150mil, USON8 2X3mm	N	-
W25Q40CL ⁴	4Mbit (512KB)	2048 pages, 4KB sectors, 32/64KB blocks, Dual/Quad SPI Fast Write, Enhanced ³	2.3V - 3.6V and 2.7V - 3.6V	-40 to +85	104MHz (208/416MHz Dual/ Quad-SPI)	SOIC8 150mil, SOIC8 208mil, WSON 6X5mm, PDIP8 300mil, VSOP8 150mil, USON8 2X3mm	P	-
W25Q40BW	4Mbit (512KB)	2048 pages, 4KB sectors, 32/64KB blocks, Dual/Quad-SPI Fast Write, Enhanced ³	1.65V -1.95V	-40 to +85	80MHz (160/320MHzDual/ Quad-SPI)	SOIC8 150mil, SOIC8 208mil, WSON 6X5mm, VSOP8 150mil, USON8 2X3mm	P	-
W25Q80BV	8Mbit (1MB)	4096 pages, 4KB sectors, 32/64KB blocks, Dual/Quad-SPI Enhanced ³	2.7V - 3.6V	-40 to +85 -40 to +105	80/104MHz (160/320MHzDual/ Quad-SPI)	SOIC8 150mil, SOIC8 208mil, WSON 6X5mm, PDIP8 300mil, VSOP8 150mil, VSOP8 208mil, USON8 2X3mm, TFBGA24 8x6mm (8x6 Matrix), TFBGA24 8x6mm (5x5 Matrix)	P	P
W25Q80BL	8Mbit (1MB)	4096 pages, 4KB sectors, 32/64KB blocks, Dual/Quad SPI, Fast Write, Enhanced ³	2.3V - 3.6V	-40 to +85	50/80MHz (100/200MHz Dual/ Quad-SPI)	SOIC8 150mil, SOIC8 208mil, WSON 6X5mm, PDIP8 300mil, VSOP8 150mil, VSOP8 208mil, USON8 2X3mm	P	-
W25Q80BW	8Mbit (1MB)	4096 pages, 4KB sectors, 32/64KB blocks, Dual/Quad SPI, Fast Write Enhanced ³	1.65V -1.95V	-40 to +85	80MHz (160/320MHz Dual/ Quad-SPI)	SOIC8 150mil, SOIC8 208mil, WSON 6X5mm, VSOP8 150mil, VSOP8 208mil, WLBGA8	P	-

Status¹: P= Mass Production, S (Time)= Samples (Ready Time), UD (Time)= Under Development (Ready Time), N= Not recommended for new designs
RoHS²: All Winbond products are "Green", Halogen-Free and RoHS compliant packaging. Refer to the datasheet for details and specifications.

Enhanced³ = SFDP, Security Registers, Program/Erase Suspend/Resume, Word Read Quad I/O, Burst Read with Wrap, Non-Volatile & Volatile Registers, Complement Array Protection

W25Q05CL/10CL/20CL/40CL⁴: Please contact Winbond for availability of these products and the 6x5mm WSON package.

Contact us: SpiFlash@winbond.com



Flash Memory

Serial Flash

SpiFlash W25X & W25Q Memory Overview & Selection Guide

Part No.	Density	Organization	Voltage	Temp.	Speed	Package(s)	Status ^{1,2}	Automotive
W25Q16CV	16Mbit (2MB)	8192 pages, 4KB sectors, 32/64KB blocks, Dual/Quad-SPI Enhanced ³	2.7V - 3.6V	-40 to +85 -40 to +105	80/104MHz (160/320MHz Dual/Quad-SPI)	SOIC8 150mil, SOIC8 208mil, SOIC16 300mil, WSON 6X5mm, PDIP8 300mil, TFBGA24 6X8mm (4x6 Matrix), TFBGA24 6X8mm (5x5 Matrix), VSOP8 150mil, VSOP8 208mil	N	P
W25Q16DV	16Mbit (2MB)	8192 pages, 4KB sectors, 32/64KB blocks, Dual/Quad-SPI Enhanced ³	2.7V - 3.6V	-40 to +85 -40 to +105	80/104MHz (160/320MHz Dual/Quad-SPI)	SOIC8 150mil, SOIC8 208mil, SOIC16 300mil, WSON 6X5mm, PDIP8 300mil, TFBGA24 6X8mm (4x6 Matrix), TFBGA24 6X8mm (5x5 Matrix), VSOP8 150mil, VSOP8 208mil	P	-
W25Q16CL	16Mbit (2MB)	8192 pages, 4KB sectors, 32/64KB blocks, Dual/Quad SPI, Enhanced ³	2.3V - 3.6V	-40 to +85	50/80MHz (100/200MHz Dual/Quad-SPI)	SOIC8 150mil, SOIC8 208mil, SOIC16 300mil, WSON 6X5mm, PDIP8 300mil, TFBGA24 6X8mm (4x6 Matrix), TFBGA24 6X8mm (5x5 Matrix), VSOP8 150mil, VSOP8 208mil	P	-
W25Q16DW	16Mbit (2MB)	8192 pages, 4KB sectors, 32/64KB blocks, Dual/Quad SPI, QPI, Enhanced ³	1.65V - 1.95V	-40 to +85 -40 to +105	104MHz (208/416MHz Dual/Quad-SPI)	SOIC8 150mil, SOIC8 208mil, SOIC16 300mil, WSON 6X5mm, TFBGA24 6X8mm (4x6 Matrix), TFBGA24 6X8mm (5x5 Matrix), VSOP8 150mil, VSOP8 208mil, USON8 4x3mm, WLPGA8	P	P

Status¹: P= Mass Production, S (Time)= Samples (Ready Time), UD (Time)= Under Development (Ready Time), N= Not recommended for new designs
RoHS²: All Winbond products are "Green", Halogen-Free and RoHS compliant packaging. Refer to the datasheet for details and specifications.

Enhanced³ = SFDP, Security Registers, Program/Erase Suspend/Resume, Word Read Quad I/O, Burst Read with Wrap, Non-Volatile & Volatile Registers, Complement Array Protection

W25Q05CL/10CL/20CL/40CL⁴: Please contact Winbond for availability of these products and the 6x5mm WSON package.

Contact us: SpiFlash@winbond.com



Serial Flash

SpiFlash W25X & W25Q Memory Overview & Selection Guide

Part No.	Density	Organization	Voltage	Temp.	Speed	Package(s)	Status ^{1,2}	Automotive
W25Q32BV	32Mbit (4MB)	16384 pages, 4KB sectors, 32/64KB blocks, Dual/Quad-SPI Enhanced ³	2.7V - 3.6V	-40 to +85 -40 to +105	80/104MHz (208/320MHz Dual/Quad-SPI)	SOIC8 208mil, SOIC16 300mil, WSON 6X5mm, TFBGA24 6X8mm (4x6 Matrix), TFBGA24 6X8mm (5x5 Matrix), VSOP8 208mil, WSON8 8X6mm, PDIP8 300mil	N	P
W25Q32FV	32Mbit (4MB)	16384 pages, 4KB sectors, 32/64KB blocks, Dual/Quad-SPI, QPI, Enhanced ³	2.7V - 3.6V	-40 to +85 -40 to +105	104MHz (208/320MHz Dual/Quad-SPI)	SOIC8 208mil, SOIC16 300mil, WSON 6X5mm, WSON8 8X6mm, PDIP8 300mil, TFBGA24 6X8mm (4x6 Matrix), TFBGA24 6X8mm (5x5 Matrix), VSOP8 208mil	P	UD
W25Q32DW	32Mbit (4MB)	16384 pages, 4KB sectors, 32/64KB blocks, Dual/Quad SPI, QPI, Enhanced ³	1.65V -1.95V	-40 to +85 -40 to +105	104MHz (208/416MHz Dual/Quad-SPI)	SOIC8 208mil, SOIC16 300mil, WSON 6X5mm, WSON8 8X6mm, TFBGA24 6X8mm (4x6 Matrix), TFBGA24 6X8mm (5x5 Matrix), VSOP8 208mil	N	UD
W25Q32FW	32Mbit (4MB)	16384 pages, 4KB sectors, 32/64KB blocks, Dual/Quad SPI, QPI, Enhanced ³	1.65V -1.95V	-40 to +85 -40 to +105	104MHz (208/416MHz Dual/Quad-SPI)	SOIC8 208mil, SOIC16 300mil, WSON 6X5mm, WSON8 8X6mm, TFBGA24 6X8mm (4x6 Matrix), TFBGA24 6X8mm (5x5 Matrix), USON8 4x3mm, VSOP8 208mil	UD	UD

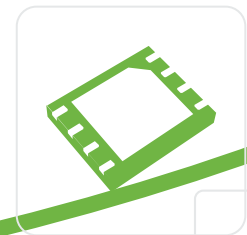
Status¹: P= Mass Production, S (Time)= Samples (Ready Time), UD (Time)= Under Development (Ready Time), N= Not recommended for new designs

RoHS²: All Winbond products are "Green", Halogen-Free and RoHS compliant packaging. Refer to the datasheet for details and specifications.

Enhanced³ = SFDP, Security Registers, Program/Erase Suspend/Resume, Word Read Quad I/O, Burst Read with Wrap, Non-Volatile & Volatile Registers, Complement Array Protection

W25Q05CL/10CL/20CL/40CL⁴: Please contact Winbond for availability of these products and the 6x5mm WSON package.

Contact us: SpiFlash@winbond.com



擔當

創新

群效

Accountability / Innovation / Teamwork

Flash Memory

Serial Flash

SpiFlash W25X & W25Q Memory Overview & Selection Guide

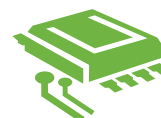
Part No.	Density	Organization	Voltage	Temp.	Speed	Package(s)	Status ^{1,2}	Automotive
W25Q64CV	64Mbit (8MB)	32768 pages, 4KB sectors, 32/64KB blocks, Dual/Quad-SPI Enhanced ³	2.7V - 3.6V	-40 to +85 -40 to +105	80MHz (160/320MHz Dual/Quad-SPI)	SOIC8 208mil, SOIC16 300mil, WSON 6X5mm, WSON8 8X6mm, PDIP8 300mil, TFBGA24 6X8mm (4x6 Matrix), TFBGA24 6X8mm (5x5 Matrix), VSOP8 208mil	N	P
W25Q64FV	64Mbit (8MB)	32768 pages, 4KB sectors, 32/64KB blocks, Dual/Quad-SPI, QPI Enhanced ³	2.7V - 3.6V	-40 to +85 -40 to +105	104MHz (208/416MHz Dual/Quad-SPI)	SOIC8 208mil, SOIC16 300mil, WSON 6X5mm, WSON8 8X6mm, PDIP8 300mil, TFBGA24 6X8mm (4x6 Matrix), TFBGA24 6X8mm (5x5 Matrix), VSOP8 208mil	P	UD
W25Q64DW	64Mbit (8MB)	32768 pages, 4KB sectors, 32/64KB blocks, Dual/Quad SPI, QPI, Enhanced ³	1.65V - 1.95V	-40 to +85 -40 to +105	104MHz (208/416MHz Dual/Quad-SPI)	SOIC8 208mil, SOIC16 300mil, WSON 6X5mm, WSON8 8X6mm, TFBGA24 6X8mm (4x6 Matrix), TFBGA24 6X8mm (5x5 Matrix), VSOP8 208mil	N	UD
W25Q64FW	64Mbit (8MB)	32768 pages, 4KB sectors, 32/64KB blocks, Dual/Quad SPI, QPI, Enhanced ³	1.65V - 1.95V	-40 to +85 -40 to +105	104MHz (208/416MHz Dual/Quad-SPI)	SOIC8 208mil, SOIC16 300mil, WSON 6X5mm, WSON8 8X6mm, TFBGA24 6X8mm (4x6 Matrix), TFBGA24 6X8mm (5x5 Matrix), USON 4x3mm, VSOP8 208mil	P	UD

Status¹: P= Mass Production, S (Time)= Samples (Ready Time), UD (Time)= Under Development (Ready Time), N= Not recommended for new designs
RoHS²: All Winbond products are "Green", Halogen-Free and RoHS compliant packaging. Refer to the datasheet for details and specifications.

Enhanced³ = SFDP, Security Registers, Program/Erase Suspend/Resume, Word Read Quad I/O, Burst Read with Wrap, Non-Volatile & Volatile Registers, Complement Array Protection

W25Q05CL/10CL/20CL/40CL⁴: Please contact Winbond for availability of these products and the 6x5mm WSON package.

Contact us: SpiFlash@winbond.com



Serial Flash

SpiFlash W25X & W25Q Memory Overview & Selection Guide

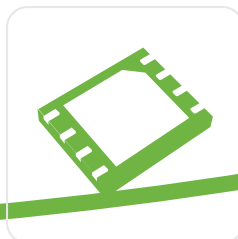
Part No.	Density	Organization	Voltage	Temp.	Speed	Package(s)	Status ^{1,2}	Automotive
W25Q128BV	128Mbit (16MB)	65536 pages, 4KB sectors, 32/64KB blocks, Dual/Quad-SPI Enhanced ³	2.7V - 3.6V	-40 to +85 -40 to +105	70/104MHz (208/280MHz Dual/Quad-SPI)	SOIC16 300mil, WSON8 8X6mm, TFBGA24 6X8mm (4x6 Matrix), TFBGA24 6X8mm (5x5 Matrix)	N	P
W25Q128FV	128Mbit (16MB)	65536 pages, 4KB sectors, 32/64KB blocks, Dual/Quad-SPI, QPI, Enhanced ³	2.7V - 3.6V	-40 to +85 -40 to +105	104MHz (208/416MHz Dual/Quad-SPI)	SOIC8 208mil, SOIC16 300mil, WSON 6X5mm, WSON8 8X6mm, PDIP8 300mil, TFBGA24 6X8mm (4x6 Matrix), TFBGA24 6X8mm (5x5 Matrix), VSOP8 208mil	P	UD
W25Q128FW	128Mbit (16MB)	65536 pages, 4KB sectors, 32/64KB blocks, Dual/Quad-SPI, QPI, Enhanced ³	1.65V -1.95V	-40 to +85 -40 to +105	104MHz (208/416MHz Dual/Quad-SPI)	SOIC8 208mil, SOIC16 300mil, WSON 6X5mm, WSON8 8X6mm, TFBGA24 6X8mm (4x6 Matrix), TFBGA24 6X8mm (5x5 Matrix), VSOP8 208mil	P	UD
W25Q256FV	256Mbit (32MB)	131072 pages, 4KB sectors, 32/64KB blocks, Dual/Quad-SPI, QPI, Enhanced ³	2.7V - 3.6V	-40 to +85 -40 to +105	104MHz (208/416MHz Dual/Quad-SPI)	SOIC16 300mil, WSON8 8X6mm, TFBGA24 6X8mm (4x6 Matrix), TFBGA24 6X8mm (5x5 Matrix)	P	UD
W25Q512JV	512Mbit (64MB)	262144pages, 4KB sectors, 32/64KB blocks, Dual/Quad-SPI, QPI, Enhanced ³	2.7V - 3.6V	-40 to +85 -40 to +105	104MHz (208/416MHz Dual/Quad-SPI)	SOIC16 300mil, WSON8 8X6mm, TFBGA24 6X8mm (4x6 Matrix), TFBGA24 6X8mm (5x5 Matrix)	UD	UD

Status¹: P= Mass Production, S (Time)= Samples (Ready Time), UD (Time)= Under Development (Ready Time), N= Not recommended for new designs
RoHS²: All Winbond products are "Green", Halogen-Free and RoHS compliant packaging. Refer to the datasheet for details and specifications.

Enhanced³ = SFDP, Security Registers, Program/Erase Suspend/Resume, Word Read Quad I/O, Burst Read with Wrap, Non-Volatile & Volatile Registers, Complement Array Protection

W25Q05CL/10CL/20CL/40CL⁴: Please contact Winbond for availability of these products and the 6x5mm WSON package.

Contact us: SpiFlash@winbond.com



擔當

創新

群效

Accountability / Innovation / Teamwork

Flash Memory

Parallel Flash Memory –W29GL Family

Winbond's W29GL family of 3-Volt Page-Mode Parallel Flash memories are offered in densities from 32Mb to 512Mb and support industry standard interfaces, architectures and packages. They are drop-in replacements to the popular "x29GL" products available in the industry, with no firmware change. The W29GL family also offers faster program and erase times, which can improve production throughput and enable faster firmware updates. Winbond's Parallel Flash products are ideal for a wide variety of applications requiring the higher performance of a parallel bus width and page mode operation.



W29GL Page Mode Parallel Flash Family

- 32Mb to 512Mb densities
- Compatible with Industry Standard x29GL products
- 2.7V to 3.6V operation; also supports V_{IO} at 1.8V
- x8/x16 data bus configuration
- 70/90ns read access time, 25ns page mode access time
- Provides many sector protection mechanisms
 - * Offers additional security of code/data

Package Options

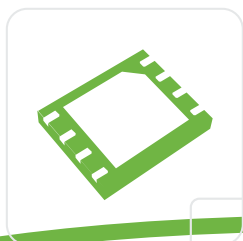
- Industry standard packages for 32Mb & 64Mb densities
 - * 48-pin TSOP (Top/Bottom Boot)
 - * 48-ball VFBGA (Top/Bottom Boot)
 - * 56-pin TSOP (High/Low Sector protect)
 - * 64-ball LFBGA (Top/Bottom Boot, High/Low Sector protect)
- Industry standard packages for 128Mb to 512Mb densities
 - * 56-pin TSOP (High/Low Sector protect)
 - * 64-ball LFBGA (High/Low Sector protect)

Special Features

- Drop-in replacement of Industry Standard x29GL
 - * No firmware change needed
- Saves 40% erase time and 60% program time
 - * Improves production throughput
 - * Faster firmware updates

Wide Range of Applications

- Networking, Storage, Set-Top-Box, DSL and Cable modems
- Wireless routers, Digital TV, Industrial, Automotive
- PC peripherals, Printer, Mobile phones, Cameras and more



Parallel Flash

Parallel Flash Product Selection Guide (Page Mode Parallel Flash)

Part No.	Density	Organization	Voltage	Temp.	Speed	Remark	Package	Status ^{1,2}	Automotive
W29GL032C	32Mbit	4Mbit x 8/ 2Mbit x 16	3V/3.3V	-40 to +85	70ns	Top Boot Bottom Boot High Sector Low Sector	TSOP 56 ³ LFBGA 64 ³ TSOP 48 TFBGA 48	P	UD
W29GL064C	64Mbit	8Mbit x 8/ 4Mbit x 16	3V/3.3V	-40 to +85	70ns	Top Boot Bottom Boot High Sector Low Sector	TSOP 56 LFBGA 64 TSOP 48 TFBGA 48	P	UD
W29GL128C	128Mbit	16Mbit x 8/ 8Mbit x 16	3V/3.3V	-40 to +85	90ns	High Sector Low Sector	TSOP 56 LFBGA 64	P	UD
W29GL256C ³	256Mbit	32Mbit x 8/ 16Mbit x 16	3V/3.3V	-40 to +85	90ns	High Sector Low Sector	TSOP 56 LFBGA 64	UD	UD
W29GL512C ³	512Mbit	32Mbit x 8/ 16Mbit x 16	3V/3.3V	-40 to +85	90ns	High Sector Low Sector	TSOP 56 LFBGA 64	UD	UD

Status¹: P= Mass Production, S (Time)= Samples (Ready Time), UD (Time)= Under Development (Ready Time), N= Not recommended for new designs
RoHS²: All Winbond products are "Green", Halogen-Free and RoHS compliant packaging. Refer to the datasheet for details and specifications.
Availability³: Please contact Winbond for availability of these products and packages.

Contact us: ParallelFlash@winbond.com

NAND Flash

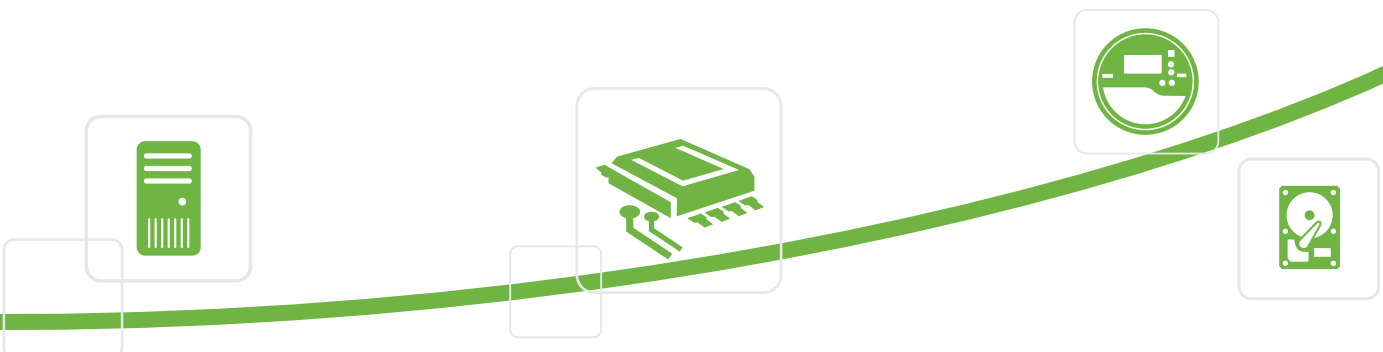
We will be offering SLC NAND Flash products starting in 2013. For further information please contact Winbond sales.

NANDFlash@winbond.com

KGD

We offer various KGD type Parallel Flash and Serial Flash, further information please contact

Flash-KGD@winbond.com



Product Selection Guide 2013



www.winbond.com

Worldwide Sales Offices

Winbond Electronics Corp.(CTSP Site)

No. 8, Keya 1st Rd., Daya Dist., Central Taiwan Science Park, Taichung City, 42881, Taiwan
Tel: 886-4-2521-8168

Jhubei Office

No. 539, Sec. 2, Wenxing Rd., Jhubei City, Hsinchu County 30274, Taiwan
Tel: 886-3-567-8168

Taipei Office

8F, No. 480, Rueiguang Rd., Neihu Dist., Taipei City 114, Taiwan
Tel: 886-2-8177-7168

Winbond Electronics Corporation America

2727 North First St., San Jose, CA 95134, U.S.A.
Tel: 1-408-943-6666

Winbond Electronics (Suzhou) Limited

Room 515, International Corporation Garden(4 floor, District E), No.2,
Xugongqiao Road, Huaqiao Town, Kunshan City, Jiangsu Province, China
Tel: 86-512-8163-8168

Shenzhen Office

Tel: 86-755-3301-9858

Winbond Electronics (H.K.) Limited

Unit 9-11, 22F, Millennium City 2, 378 Kwun Tong Rd.,
Kowloon, Hong Kong
Tel: 852-2751-3126

Winbond Electronics Corporation Japan

NO. 2 Ueno-Bldg., 7-18, 3-chome, Shinyokohama, Kouhoku-ku,
Yokohama-shi, 222-0033, Japan
Tel: 81-45-478-1881