



FLASH MEMORY
QUICK REFERENCE GUIDE

Product Overview

Every design has unique needs.

That's why Spansion™ Flash memory devices are offered in a broad variety of densities, voltages, and features – to give you the freedom to design the way you want.

**The Spansion product portfolio delivers what you need
for your wireless and embedded applications –
innovation, performance, reliability, flexibility.**

Conventional

	512Kb	1Mb	2Mb	4Mb	8Mb	16Mb	32Mb	64Mb	128Mb	256Mb	512Mb
1.8V											
Am29SL				■	■	■					
MBM29SL					■						
3.0V MirrorBit™											
S29AL						■					
3.0V											
Am29LV		■	■	■	■	■	■	■	■		
MBM29LV			■	■	■	■					
5.0V											
Am29F		■	■	■	■	■	■				
MBM29F			■	■	■	■	■				
3.0V MirrorBit											
S29GL							■	■	■	■	■
3.0V											
Am29PL						■	■				
MBM29PL						■					
3.0V											
Am29BL					■	■					

+Page Mode

+Burst Mode

Simultaneous Read+Write

+Page Mode

+Burst Mode

SPI

	512Kb	1Mb	2Mb	4Mb	8Mb	16Mb	32Mb	64Mb	128Mb	256Mb	512Mb
1.8V											
Am29DS						■	■				
3.0V											
S29JL/S70JL									■		
Am29DL				■	■	■	■	■			
MBM29DL				■	■	■	■	■			
3.0V											
S29PL							■	■	■		
Am29PDL								■	■		
MBM29QM									■		
1.8V MirrorBit™											
S29WS-N								■	■	■	
1.8V											
S29WS-J							■	■	■		
Am29BDS							■	■	■		
MBM29BS							■	■	■		
MBM29BT							■	■			
MBM29FS									■		
2.5V											
S29CD						■	■				
3.0V											
S25FL	■	■	■								

Looking for MCP Solutions?

Visit www.spansion.com or contact your local sales team for information on the many MCP Flash memory solutions based on the Flash memory architectures in this Quick Reference Guide.

Conventional

Our conventional product families provide a broad spectrum of choices for customers who want to find the optimal solution for their designs.

Whether you desire:

MirrorBit™ technology or floating gate technology

A simple 1 Mb device or the groundbreaking 512 Mb device

1.8V or 3.0V or 5.0V system voltage

Page or burst mode

Spansion offers the flexibility and features to make your design process faster and easier.

MirrorBit technology achieves price-performance leadership

by leveraging its fundamental advantages:

2-bit per cell architecture

Capable of better yield across densities

Fewer critical mask layers – reduces sensitivity to defects during the manufacturing process and improves outgoing product quality

Simple, streamlined manufacturing process – faster fab throughput

Conventional



	Density	Part No.	Access Times	Packages	Temperature	V _{cc} (V)	V _{io} (V)	Organization	Sector	Features
1.8V	4 Mb	Am29SL400D	90, 100, 120	WA48	C, I	1.65-1.95		x8/x16	T, B	Sectors(Kb):16,2x8,32,7x64
	8 Mb	Am29SL800D	90, 100, 120, 150	E48, F48, WA48, WC48	C, I	1.65-2.2		x8/x16	T, B	Sectors(Kb):16,2x8,32,15x64
	16 Mb	Am29SL160C	90, 100,120, 150	E48, WC48	C, I, E	1.8-2.2		x8/x16	T, B	Sectors(Kb):8x8,31x64; WP#/ACC pin; SecSi™ Sector
	8 Mb	MBM29SL800T/BE	90, 100	PBT48, PW45	I	1.65-1.95		x8/x16	T, B	Sectors(Kb):16,2x8,32,15x64
MirrorBit™ 3.0V	16 Mb	S29AL016M	90, 100	TA/F48, BA/F48, FA/F64	I	2.7-3.6		x8/x16	T, B	Sectors(Kb):16,2x8,32,31x64; SecSi Sector
3.0V	1 Mb	Am29LV001B	45	E32, F32, J32	C, I	3.0-3.6		x8	T, B	Sectors(Kb):8,2x4,7x16
			55, 70, 90		C, I, E	2.7-3.6				
	1 Mb	Am29LV010B	45	E32, F32, J32	C	3.0-3.6		x8	U	Sectors(Kb):8x16
			55, 70, 90		C, I, E	2.7-3.6				
	2 Mb	Am29LV002B	55	E40, F40	C, I	3.0-3.6		x8	T, B	Sectors(Kb):16,2x8,32,3x64
			70, 90, 120		C, I, E	2.7-3.6				
	2 Mb	Am29LV200B	55	E48, F48, S44, WA48	C, I	3.0-3.6		x8/x16	T, B	Sectors(Kb):16,2x8,32,3x64
			90, 120		C, I, E	2.7-3.6				
70			E48, F48, S44	C, I	2.7-3.6					
70			WA48	C, I, E	2.7-3.6					

Conventional (cont.)

Density	Part No.	Access Times	Packages	Temperature	V _{cc} (V)	V _{io} (V)	Organization	Sector	Features
4 Mb	Am29LV004B	70	E40, F40	C, I	2.7-3.6		x8	T, B	Sectors(Kb):16,2x8,32,7x64
		90, 120		C, I, E					
4 Mb	Am29LV040B	60	E32, F32, J32	C, I	3.0-3.6		x8	U	Sectors(Kb):8x64
		70, 90, 120		C, I, E	2.7-3.6				
4 Mb	Am29LV400B	55	E48, F48, S44, WA48	C, I, D, F, K	3.0-3.6		x8/x16	T, B	Sectors(Kb):16,2x8,32,7x64
		70, 90, 120		C, I, E, D, F, K	2.7-3.6				
8 Mb	Am29LV008B	70	E40, F40	C, I	3.0-3.6		x8	T, B	Sectors(Kb):16,2x8,32,15x64
		90, 120		C, I, E	2.7-3.6				
8 Mb	Am29LV081B	70	E40, F40	C, I, F	2.7-3.6		x8	U	Sectors(Kb):16x64
		90, 120		C, I, E, F					
8 Mb	Am29LV800D	70, 90, 120	E48, F48, S44, WB48	C, I	2.7-3.6		x8/x16	T, B	Sectors(Kb):16,2x8,32,15x64
16 Mb	Am29LV017D	70, 90, 120	E40, F40, WC48	C, I	2.7-3.6		x8	U	Sectors(Kb):32x64
16 Mb	Am29LV116D	70, 90, 120	E40, F40	C, I	2.7-3.6		x8	T, B	Sectors(Kb):16,2x8,32,15x64
16 Mb	Am29LV160B	70	E48, F48, S44, WC48	C	3.0-3.6		x8/x16	T, B	Sectors(Kb):16,2x8,32,31x64
		80, 90, 120		C, I, E	2.7-3.6				
16 Mb	Am29LV160D	70, 90, 120	E48, F48, S44, WC48	C, I, E	2.7-3.6		x8/x16	T, B	Sectors(Kb):16,2x8,32,31x64

3.0V

Product Table Notes can be found on the fold-out at the back of this guide.

Conventional

+ Page Mode

+ Burst Mode

Conventional (cont.)



Density	Part No.	Access Times	Packages	Temperature	V _{cc} (V)	V _{io} (V)	Organization	Sector	Features	
3.0V	32 Mb	70	E40, F40, WD63	I	2.7-3.6		x8	U	Sectors(Kb):64x64; ACC pin	
		90, 120		I, E						
	32 Mb	Am29LV320D	90, 120	E48, WM48	C, I	2.7-3.6		x8/x16	T, B	Sectors(Kb):8x8,63x64; WP#/ACC pin; SecSi™ Sector
	64 Mb	Am29LV065D	90	E48, F48, WH63	I	3.0-3.6	3.0-5.0	x8	U	Sectors(Kb):128x64; ACC pin; SecSi Sector; VersatileI/O
			100		1.8-2.9					
			120		1.8-2.9 or 3.0-5.0					
	64 Mb	Am29LV640D	90	Z56	I	3.0-3.6	3.0-5.0	x16	H, L	Sectors(Kw):128x32; WP#, ACC pins; SecSi Sector; VersatileI/O; no RY/BY# pin
			100		1.8-2.9					
			120		3.0-5.0					
			120		1.8-2.9					
			90	WH63, PC64	I		3.0-5.0		U	Sectors(Kw):128x32; ACC pin; SecSi Sector; VersatileI/O
100			1.8-2.9							
120			3.0-5.0							
120			1.8-2.9							
64 Mb	Am29LV641D	90	E48, F48	I	3.0-3.6	3.0-5.0	x16	H, L	Sectors(Kw):128x32; WP#, ACC pins; SecSi Sector; VersatileI/O; no RY/BY# pin	
		100		1.8-2.9						
		120	I, E	3.0-5.0						
		120	1.8-2.9							

Conventional (cont.)

Density	Part No.	Access Times	Packages	Temperature	V _{cc} (V)	V _{io} (V)	Organization	Sector	Features
3.0V	64 Mb	Am29LV640G	WH63, PC64	I	3.0-3.6	3.0-3.6	x16	U	Sectors(Kw):128x32; ACC pin; SecSi™ Sector; VersatileI/O
					2.7-3.6	2.7-3.6			
	64 Mb	Am29LV641G	E48, F48	I	3.0-3.6	3.0-3.6	x16	H, L	Sectors(Kw):128x32; WP#, ACC pins; SecSi Sector; VersatileI/O
					2.7-3.6	2.7-3.6			
	2 Mb	MBM29LV002T/BC	PTN40, PTR40	I	3.0-3.6		x8	T, B	Sectors(Kb):16,2x8,32,3x64
					2.7-3.6				
	2 Mb	MBM29LV200T/BC	PFTN48, PFTR48, PF44	I	3.0-3.6		x8/x16	T, B	Sectors(Kb):16,2x8,32,3x64
					2.7-3.6				
	4 Mb	MBM29LV004T/BC	PTN40, PTR40	I	3.0-3.6		x8	T, B	Sectors(Kb):16,2x8,32,7x64
					2.7-3.6				
	4 Mb	MBM29LV400T/BC	PF44, PFTN48, PFTR48, PCV48, PBT48, PW48	C2	3.0-3.6		x8/x16	T, B	Sectors(Kb):16,2x8,32,7x64
				I	2.7-3.6				
	8 Mb	MBM29LV008T/BA	PTN40, PTR40	I	3.0-3.6		x8	T, B	Sectors(Kb):16,2x8,32,15x64
					2.7-3.6				
8 Mb	MBM29LV080A	PTN40, PTR40	I	3.0-3.6		x8	U	Sectors(Kb):16,2x8,32,15x64	
				2.7-3.6					
8 Mb	MBM29LV800T/BE	TN48, PCV48, PBT48	C2	3.0-3.6		x8/x16	T, B	Sectors(Kb):16,2x8,32,15x64	
			I	2.7-3.6					
16 Mb	MBM29LV160T/BE	TN48, TR48, PCV48, PBT48	I	2.7-3.6		x8/x16	T, B	Sectors(Kb):16,2x8,32,31x64	

Product Table Notes can be found on the fold-out at the back of this guide.

Conventional (cont.)



5.0V

Density	Part No.	Access Times	Packages	Temperature	V _{cc} (V)	V _{io} (V)	Organization	Sector	Features
1 Mb	Am29F010B	45	P32	C, I	4.75-5.25		x8	U	Sectors(Kb):8x16
			J32, E32, F32	C, I, E					
		55, 70	P32	C, I	4.5-5.5				
J32, E32, F32	C, I, E								
		90, 120	P32, J32, E32, F32	C, I, E					
2 Mb	Am29F002B, Am29F002NB	55	P32	C	4.75-5.25		x8	T, B	Sectors(Kb):16,2x8,32,3x64
		55	J32, E32	C, I					
		70	P32, J32, E32	C, I	4.5-5.5				
		90, 120		C, I, E					
2 Mb	Am29F200B	45	E48, F48, S44	C, I	4.75-5.25	x8/x16	T, B	Sectors(Kb):16,2x8,32,3x64	
		50		C, I, E					
		55, 70, 90, 120			4.5-5.5				
4 Mb	Am29F004B	55	J32	I	4.75-5.25	x8	T, B	Sectors(Kb):16,2x8,32,7x64	
		70			4.5-5.5				
		90, 120		I, E					
4 Mb	Am29F040B	55	J32, E32, F32	C, I, E	4.75-5.25	x8	U	Sectors(Kb):8x64	
		70							
		90, 120, 150	P32, J32, E32, F32		4.5-5.5				

Conventional (cont.)

Density	Part No.	Access Times	Packages	Temperature	V _{cc} (V)	V _{io} (V)	Organization	Sector	Features
4 Mb	Am29F400B	45	E48, F48, S44	C, I	4.75-5.25		x8/x16	T, B	Sectors(Kb):16,2x8,32,7x64
		50, 55		C, I, E					
		55, 70, 90, 120, 150							
8 Mb	Am29F080B	55	E40, F40, S44	C, I	4.75-5.25		x8	U	Sectors(Kb):16x64
		70		C, I, E	4.5-5.5				
		90							
		120, 150							
8 Mb	Am29F800B	55, 70, 90, 120, 150	E48, F48, S44, WB48	C, I, E	4.5-5.5		x8/x16	T, B	Sectors(Kb):16,2x8,32,15x64
16 Mb	Am29F016D	70	E4-40, F4-40, E48, F48, S44	C, I	4.5-5.5		x8	U	Sectors(Kb):32x64
		90, 120, 150		C, I, E					
16 Mb	Am29F017D	70	E4-40, F4-40, E48, F48,	C, I	4.5-5.5		x8	U	Sectors(Kb):32x64
		90, 120, 150		C, I, E					
16 Mb	Am29F160D	70	E48, F48	C, I	4.75-5.25		x8/x16	T, B	Sectors(Kb):16,2x8,32,31x64; WP# pin
		70	E48		4.5-5.5				
		90, 120	E48, F48						
32 Mb	Am29F032B	70	E40, F40, S44	C, I	4.75-5.25		x8	U	Sectors(Kb):64x64
		90, 120, 150		C, I, E	4.5-5.5				

50V

Product Table Notes can be found on the fold-out at the back of this guide.

Conventional

+ Page Mode

+ Burst Mode

Conventional (cont.)



5.0V

Density	Part No.	Access Times	Packages	Temperature	V _{cc} (V)	V _{io} (V)	Organization	Sector	Features
2 Mb	MBM29F002T/BC	55	PD32, PFTN32, PFTR32	C2	4.75-5.25		x8	T, B	Sectors(Kb):16,2x8,32,3x64
		70, 90		I	4.5-5.5				
2 Mb	MBM29F200T/BC	55	PF44, PFTN48, PFTR48	C2	4.75-5.25		x8/x16	T, B	Sectors(Kb):16,2x8,32,3x64
		70, 90		I	4.5-5.5				
4 Mb	MBM29F004T/BC	70	PD32, PFTN32, PFTR32	C2	4.5-5.5		x8	T, B	Sectors(Kb):16,2x8,32,7x64
		90		I					
4 Mb	MBM29F040C	55	PD32, PFTN32, PFTR32	C2	4.75-5.25		x8	U	Sectors(Kb):8x64
		70, 90		I	4.5-5.5				
4 Mb	MBM29F400T/BC	55	PF44, PFTN48, PFTR48	C2	4.75-5.25		x8/x16	T, B	Sectors(Kb):16,2x8,32,7x64
		70, 90		I	4.5-5.5				
8 Mb	MBM29F080A	55	PFTN48, PFTR48, PTN40, PTR40, PF44	C2	4.75-5.25		x8	U	Sectors(Kb):16x64
		70, 90		I	4.5-5.5				
8 Mb	MBM29F800T/BA	55	PF44, PFTN48, PFTR48	C2	4.75-5.25		x8/x16	T, B	Sectors(Kb):16,2x8,32,15x64
		70, 90		I	4.5-5.5				
16 Mb	MBM29F016A	70	PFTN48, PFTR48	C2	4.75-5.25		x8	U	Sectors(Kb):32x64
		90		I	4.5-5.5				
16 Mb	MBM29F017A	70	PNS40, PFTN48, PFTR48	C2	4.75-5.25		x8	U	Sectors(Kb):32x64
		90		I	4.5-5.5				
16 Mb	MBM29F160T/BE	70, 90	TN48, TR48	I	4.5-5.5		x8/x16	T, B	Sectors(Kb):16,2x8,32,31x64
32 Mb	MBM29F033	70	PTN40, PTR40	C2	4.75-5.25		x8	U	Sectors(Kb):64x64
		90		I	4.5-5.5				

Product Table Notes can be found on the fold-out at the back of this guide.

Conventional

+ Page Mode

+ Burst Mode

Conventional + Page Mode



Density	Part No.	Access Times	Packages	Temperature	V _{cc} (V)	V _{io} (V)	Organization	Sector	Features
32 Mb	S29GL032M	90 (25), 100 (30), 110 (30)	TA/F40, BA/F48	I	3.0-3.6		x8	U	Sectors(Kb):64x64; ACC; SecSi™ Sector
			TA/F56, FA/F64					H, L	Sectors(Kb):64x64; WP#/ACC pin; SecSi Sector
			TA/F48, BA/F48, FA/F64, TB/C48, BB/C48					T, B	Sectors(Kb):63x64,8x8; WP#/ACC pin; SecSi Sector
64 Mb	S29GL064M	90 (25), 100 (30), 110 (30)	TA/F48, BA/F48	I	3.0-3.6		x8	U	Sectors(Kb):128x64; ACC pin; SecSi Sector
			BA/F48, FA/F48					U	
			TA/F48				H	Sectors(Kb):128x64; WP#, ACC pins; SecSi Sector	
			TA/F48, TB/C48				L		
			TA/F56, FA/F64				H	Sectors(Kb):128x64; WP#/ACC pin; SecSi Sector	
			TA/F56, TB/C48, TB/C56				L		
			TA/F48, BA/F48, FA/F64				T, B		Sectors(Kb):127x64,8x8; WP#/ACC pin; SecSi Sector
128 Mb	S29GL128M	90 (25), 100 (30)	TA/F56, FA/F64	I	3.0-3.6		x8/x16	H	Sectors(Kb):256x64; WP#/ACC pin; SecSi Sector
			TA/F56, FA/F64, TB/C56					L	

3.0V MirrorBit™

Conventional + Page Mode (cont.)

	Density	Part No.	Access Times	Packages	Temperature	V _{cc} (V)	V _{io} (V)	Organization	Sector	Features
3.0V MicroBic™	256 Mb	S29GL256M	100 (30), 110 (30)	TA/F56, FA/F64	I	3.0-3.6		x8/x16	H, L	Sectors(Kb):512x64; WP#/ACC pin; SecSi™ Sector
	128 Mb	S29GL128N	80 (25), 90 (25)	TA56, FA64	I	2.7-3.6	2.7-3.6	x8/x16	H, L	Sectors(Kb):128x128; WP#/ACC pin; SecSi Sector; Advanced Sector Protection; VersatileI/O
			90 (35), 100 (35)				1.65-1.95			
	256 Mb	S29GL256N	80 (25), 90 (25)	TA56, FA64	I	2.7-3.6	2.7-3.6	x8/x16	H, L	Sectors(Kb):256x128; WP#/ACC pin; SecSi Sector; Advanced Sector Protection; VersatileI/O
90 (35), 100 (35)			1.65-1.95							
512 Mb	S29GL512N	90 (25), 100 (25)	TA56, FA64	I	2.7-3.6	2.7-3.6	x8/x16	H, L	Sectors(Kb):512x128; WP#/ACC pin; SecSi Sector; Advanced Sector Protection; VersatileI/O	
		100 (35), 110(35)				1.65-1.95				
3.0V	16 Mb	Am29PL160C	65 (25), 70 (25)	E48, S44, SK44	I	3.0-3.6		x8/x16	B	Sectors(Kb): 16,2x8,224,7x256; 5V tolerant I/O
			90 (30), 120 (30)			2.7-3.6				
	32 Mb	Am29PL320D	60 (20), 70 (25)	WP84	I	3.0-3.6		x16/x32	T, B	Sectors(Kw):16,2x8,96,15x128; WP#, ACC pins; SecSi Sector
			70 (25), 90 (30)			2.7-3.6				
	16 Mb	MBM29PL160T/BD	75 (25)	PF44, PFTN48, PFTR48	C2	2.7-3.6		x8/x16	T, B	Sectors(Kb):16,2x8,224,7x256; 5V tolerant I/O
90 (35)			I							

Product Table Notes can be found on the fold-out at the back of this guide.

Conventional

+ Page Mode

+ Burst Mode

Conventional + Burst Mode



Density	Part No.	Access Times	Packages	Temperature	V _{cc} (V)	V _{io} (V)	Organization	Sector	Features
3.0V	8 Mb	Am29BL802C	Z56	I	3.0-3.6		x16	B	Sectors(Kw):8,2x4,48,3x64,2x128; 5V tolerant I/O; 32 word sequential burst
				E					
				I, E					
	16 Mb	Am29BL162C	Z56	I	3.0-3.6		x16	B	Sectors(Kw):8,2x4,112,7x128; 5V tolerant I/O; 32 word sequential burst
				E					
				I, E					
		65, 65/17							
		65, 65/18							
		70, 70/24; 90, 90/26; 120, 120/26							
		65, 65/17							
		65, 65/18							
		70, 70/24; 90, 90/26; 120, 120/26							

Product Table Notes can be found on the fold-out at the back of this guide.

Conventional

+ Page Mode

+ Burst Mode

Simultaneous Read-Write

Our award-winning simultaneous read-write architecture provides flexibility and streamlines coding for execute-in-place (XIP) applications.

Simultaneous read-write architecture combined with a burst or page mode interface is the ideal choice for a cutting edge design which demands superior performance.

Second generation MirrorBit™ technology supports the industry's leading price-performance. MirrorBit technology combined with high-throughput burst mode, broad feature sets including Advanced Sector Protection, extremely low energy consumption, and the highest densities of any NOR Flash technology results in the optimal solution for 1.8V wireless designs.

Advanced Sector Protection is the industry's most robust Flash security feature set and the only one to feature password protection for everyday consumer products. Multiple layers of security help guard against tampering with protected information while fending off network attacks.

Simultaneous Read-Write



	Density	Part No.	Access Times	Packages	Temperature	V _{cc} (V)	V _{io} (V)	Organization	Sector	Features
1.8V	16 Mb	Am29DS163D	100, 120	WA48	I, E	1.8-2.2		x8/x16	T, B	Banks:4/12Mb; WP#/ACC pin; SecSi™ Sector
	32 Mb	Am29DS323D	110, 120	E48, WM48	I	1.8-2.2		x8/x16	T, B	Banks:8/24Mb; WP#/ACC pin; SecSi Sector
3.0V	64 Mb	S29JL064H	55, 60	TA48, BA48, FA64	I	2.7-3.6		x8/x16	D	Bank:8/24/24/8Mb; WP#/ACC pin; SecSi Sector
	70, 90									
	128 Mb	S70JL128H	70, 85	BA63	I	2.7-3.6		x8/x16	D	Two S29JL064H devices in one package; WP#/ACC pin; SecSi Sector
	4 Mb	Am29DL400B	70	E48, F48, S44	C, I	2.7-3.6		x8/x16	T, B	Banks:1/3Mb
	80, 90, 120		C, I, E							
	8 Mb	Am29DL800B	70	E48, F48, S44, WB48	C, I	2.7-3.6		x8/x16	T, B	Banks:1/7Mb
	90, 120		C, I, E							
	16 Mb	Am29DL161D/162D/163D/164D	70, 90, 120	E48, WC48, PC64, VR48	I	2.7-3.6		x8/x16	T, B	Banks:(161)0.5/15.5Mb, (162)2/14Mb, (163)4/12Mb, (164)8/8Mb; WP#/ACC pin; SecSi Sector
32 Mb	Am29DL320G	70, 90, 120	E48, WD63, WM48, PC64	I	2.7-3.6		x8/x16	T, B	Flexible Bank:4/12/12/4Mb; WP#/ACC pin; SecSi Sector	
32 Mb	Am29DL322G/323G/324G	70, 90, 120	PC64, WD63, WM48	I	2.7-3.6		x8/x16	T, B	Banks:(322)4/28Mb, (323)8/24Mb, (324)16/16Mb; WP#/ACC pin; SecSi Sector	
			E48	I, E						
4 Mb	MBM29DL400T/BC	55	PFTN48, PFTR48, PBT48	C2	3.0-3.6		x8/x16	T, B	Banks:1/3Mb	
		70		I						
		90			2.7-3.6					

Simultaneous Read-Write (cont.)

Density	Part No.	Access Times	Packages	Temperature	V _{cc} (V)	V _{io} (V)	Organization	Sector	Features
30V	8 Mb	70	PFTN48, PFTR48, PBT48	I	3.0-3.6		x8/x16	T, B	Banks:1/7Mb
		90			2.7-3.6				
	16 Mb	70	TN48, TR48, PBT48	I	2.7-3.6		x8/x16	T, B	Banks:(161)0.5/15.5Mb, (162)2/14Mb, (163)4/12Mb, (164)8/8Mb; WP#/ACC pin; HiddenRom™ region
		90							
	32 Mb	MBM29DL32T/BF	70	TN48, PBT48	I	2.7-3.6		x8/x16	T, B
32 Mb	MBM29DL34T/BF	70	TN48, PBT48	I	2.7-3.6		x8/x16	T, B	Banks:8/24Mb; WP#/ACC pin; HiddenRom region
64 Mb	MBM29DL64DF	70	TN48, PBT48	I	2.7-3.6		x8/x16	D	Flexible Bank:8/24/24/8Mb; WP#/ACC pin; HiddenRom region

Product Table Notes can be found on the fold-out at the back of this guide.

Simultaneous Read-Write

+ Page Mode

+ Burst Mode

Simultaneous Read-Write + Page Mode

3.0V

Density	Part No.	Access Times	Packages	Temperature	V _{cc} (V)	V _{io} (V)	Organization	Sector	Features
32 Mb	S29PL032J	55 (20), 60 (25), 70 (30)	BA64	I, W	2.7-3.6	2.7-3.6	x16	D	Flexible Bank:4/12/12/4Mb; WP#/ACC pin; SecSi™ Sector; Advanced Sector Protection; VersatileI/O
		65 (30), 70 (30)				1.65-1.95			
64 Mb	S29PL064J	same as PL032J	BA64	I, W	2.7-3.6	same as PL032J	x16	D	same as PL032J except Flexible Bank:8/24/24/8Mb
128 Mb	S29PL127J	same as PL032J	BA64, BA80	I, W	2.7-3.6	same as PL032J	x16	D	same as PL032J except Flexible Bank:16/48/48/16Mb; single CE# pin
128 Mb	S29PL129J	same as PL032J	BA80	I, W	2.7-3.6	same as PL032J	x16	D	same as PL032J except Flexible Bank:16/48//48/16Mb; two CE# pins
64 Mb	Am29PDL640G	65 (25), 70 (25), 85 (30)	WH63, WS80	I	2.7-3.1	2.7-3.1	x16	D	Flexible Bank:8/24/24/8Mb; WP#/ACC pin; SecSi Sector; Advanced Sector Protection; VersatileI/O
		90 (45)	WS80			1.65-1.95			
128 Mb	Am29PDL127H/129H	55 (20), 65 (25)	VK80	I	2.7-3.6	2.7-3.6	x16	D	127H Flexible Bank:16/48/48/16Mb; 129H Flexible Bank:48/16//16/48; WP#/ACC pin; SecSi Sector; Advanced Sector Protection; VersatileI/O; 129H has 2 CE# pins; offered in MCP's as S29PL127H/129H
		65 (30), 85 (30)				1.65-1.95			
128 Mb	Am29PDL128G	70 (25)	PE80	I	3.0-3.6	2.7-3.6	x16/x32	D	Flexible Bank:16/48/48/16Mb; WP#, ACC pins; SecSi Sector; Advanced Sector Protection; VersatileI/O
		70 (25)							
		80 (30), 90 (35)		I, E					
128 Mb	MBM29QM12DH	60 (20)	PBT80, TSOP56	I	2.7-3.6	2.7-3.6	x16	D	
		70 (30)				1.65-1.95			

Product Table Notes can be found on the fold-out at the back of this guide.

Simultaneous Read-Write

+ Page Mode

+ Burst Mode

Simultaneous Read-Write + Burst Mode



Density	Part No.	Access Times	Packages	Temperature	V _{cc} (V)	V _{io} (V)	Organization	Sector	Features	
1.8V MirrorBit™	64 Mb	S29WS064N	BA80	I, W	1.65-1.95	1.65-1.95	x16	D	Banks:16x4Mb; WP#, ACC pins; SecSi™ Sector; Advanced Sector Protection; VersatileI/O	
										60, 59/9@80
										70, 69/11.2@66
										70, 69/13.5@54
										65, 59/11@80
										75, 69/13.2@66
75, 69/15.5@54										
128 Mb	S29WS128N	same as WS064N	BA84	I, W	1.65-1.95	same as WS064N	x16	D	same as WS064N, except Banks:16x8Mb	
256 Mb	S29WS256N	same as WS064N	BA84	I, W	1.65-1.95	same as WS064N	x16	D	same as WS064N, except Banks:16x16Mb	
1.8V	64 Mb	S29WS064J	BA80	I, W	1.65-1.95	1.65-1.95	x16	Dor none	Banks(sectors x Kw):A&D=8x4,15x32/ B&C=48x32; WP#, ACC pins; SecSi Sector; Advanced Sector Protection; VersatileI/O	
										55, 56/11.2@66
										45, 46/9.1@80
										45, 45.5/7.0@104
										65, 71/11.2@66
										55, 58.5/9.1@80
128 Mb	S29WS128J	same as WS064J	BA84	I, W	1.65-1.95	same as WS064J	x16	Dor none	Banks(sectors x Kw):A&D=8x4,31x32/ B&C=96x32; WP#, ACC pins; SecSi Sector; Advanced Sector Protection; VersatileI/O	

Simultaneous Read-Write + Burst Mode (cont.)

Density	Part No.	Access Times	Packages	Temperature	V _{cc} (V)	V _{io} (V)	Organization	Sector	Features
32 Mb	Am29BDS320G	70, 106/13.5@54	VM64	I	1.65-1.95	1.65-1.95 or 2.7-3.15	x16	T, B	Banks:8/8/8/8Mb; WP#, ACC pins; VersatileI/O; reduced wait-state handshaking
		70, 87.5/13.5@54							
		90, 120/20@40							
		90, 95/20@40							
32 Mb	Am29BDS323D	110, 120/20@40	WK47	I	1.7-1.9		x16	T	Banks:8/24Mb; WP# pin; muxed data and address
64 Mb	Am29BDS640H	45, 62/9.3@75	VM64	I	1.65-1.95	1.65-1.95	x16	D	Banks:8/24/24/8Mb; WP#, ACC pins; SecSi™ Sector; Advanced Sector Protection; VersatileI/O; reduced wait-state handshaking
		45, 49/9.3@75							
		50, 71/11@66							
		50, 56/11@66							
		55, 87.5/13.5@54							
64 Mb	Am29BDS643G /Am29N643G	70, 95/20@40	VA44	I	1.7-1.9		x16	T	Banks:16/16/16/16Mb; WP# pin; muxed data and address
		70, 87.5/13.5@54							
		55, 71/11@66							
128 Mb	Am29BDS128H	same as BDS640H	VK80	I	1.65-1.95	1.65-1.95	x16	D	Banks:16/48/48/16Mb; WP#, ACC pins; SecSi Sector; Advanced Sector Protection; VersatileI/O; reduced wait-state handshaking
32 Mb	MBM29BS32LF	70, 106/13.5@54	PBT60	I	1.65-1.95	1.65-1.95	x16	L	Flexible Bank:8/8/8/8Mb; WP#, ACC pins; VersatileI/O
		70, 120/20@40							
32 Mb	MBM29BT32LF	70, 106.5/14@54	PBT60	I	1.65-1.95	2.70-3.15	x16	L	Flexible Bank:8/8/8/8Mb; WP#, ACC pins; VersatileI/O
		70, 120/20@40							

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Product Table Notes can be found on the fold-out at the back of this guide.

Simultaneous Read-Write

+ Page Mode

+ Burst Mode

Simultaneous Read-Write + Burst Mode (cont.)



	Density	Part No.	Access Times	Packages	Temperature	V _{cc} (V)	V _{io} (V)	Organization	Sector	Features	
1.8V	64 Mb	MBM29BS64LF	70, 106/13.5@54	PBT60	I	1.65-1.95	1.65-1.95	x16	L	Flexible Bank:16/16/16/16Mb; WP#, ACC pins; VersatileI/O	
			70, 120/20@40								
	64 Mb	MBM29BT64LF	70, 106.5/14@54	PBT60	I	1.65-1.95	2.70-3.15	x16	L	Flexible Bank:16/16/16/16Mb; WP#, ACC pins; VersatileI/O	
			70, 120/20@40								
		64 Mb	MBM29BS64DH	50, 71/11@66	PBT64	I			x16	D	
		64 Mb	MBM29FS64DH	50, 56/11@66	PBT64	I			x16	D	Reduced wait-state handshaking
	128 Mb	MBM29BS12DH	50, 71/11@66	PBT80	I	1.65-1.95	1.65-1.95	x16	D	Flexible Bank:16/48/48/16Mb; WP#/ACC pin; HiddenRom™ region; VersatileI/O	
	128 Mb	MBM29FS12DH	50, 56/11@66	PBT80	I	1.65-1.95	1.65-1.95	x16	D	Flexible Bank:16/48/48/16Mb; WP#/ACC pin; HiddenRom region; Reduced wait-state handshaking; VersatileI/O	
2.5V	16 Mb	S29CD016G	54, 54/9@66	F80	I, N	2.5-2.75	1.65-1.95 or 2.5-2.75	x32	D	Banks:4/12Mb or 12/4Mb; WP#, ACC pins, SecSi™ Sector; Advanced Sector Protection; VersatileI/O	
			54, 54/9.5@66	Q80							
			64, 64/10@56	F80, Q80							
			67, 67/17@40								
	32 Mb	S29CD032G	48, 48/7.5@75	F80	I, N	2.5-2.75	1.65-1.95 or 2.5-2.75	x32	D	Banks:8/24Mb or 24/8Mb; WP#, ACC pins, SecSi Sector; Advanced Sector Protection; VersatileI/O	
			54, 54/9@66	F80							
			54, 54/9.5@66	Q80							
			64, 64/10@56	F80, Q80							
67, 67/17@40											

Product Table Notes can be found on the fold-out at the back of this guide.

Simultaneous Read-Write

+ Page Mode

+ Burst Mode

Serial Peripheral Interface

Spansion™ Flash memories supporting the Serial Peripheral Interface (SPI) standard help embedded system designers achieve:

Simpler board layout and smaller board size
Lower power consumption and system noise
Greater reliability
Overall system cost savings

Serial Peripheral Interface



Density	Part No.	Speed (MHz)	Page program (ms)	Packages	Temperature	V _{cc} (V)	Sectors (Kb)	Features
512 Kb	S25FLK05D	25	8 (typ.)	MA8	C, I	2.7-3.6	2x256	W# memory protection; SPI bus compatible
1 Mb	S25FL001D	25	8 (typ.)	MA8	C, I	2.7-3.6	4x256	W# memory protection; SPI bus compatible
2 Mb	S25FL002D	25	8 (typ.)	MA8	C, I	2.7-3.6	4x512	W# memory protection; SPI bus compatible

Part Number Construction

(S)
Spansion™ Ordering Part Number Construction: Single-die Products

Generic OPN									Ordering Options							
Prefix	Series		Family		Density			Tech	Speed		Package		Temp	Model Number		Pack Type
S	2	9	G	L	5	I	2	N	I	0	F	A	I	0	0	2

Prefix
S = Spansion™ memory

Product Series
25 = Serial Peripheral Interface (SPI) Flash memory
29 = Sector Erase NOR Flash memory

Core Voltage
F = 5-volt VCC
L = 3-volt VCC

Density
K05 = 512 Kb
001-999 = 1 Mb – 999 Mb
01G-64G = 1 Gb – 64 Gb

D = 2.5-volt VCC
S = 1.8-volt VCC

Flash Interface and Simultaneous Read-Write

	SRW	No SRW
Standard	J	A
Page	P	G
Burst (Demux Add/Data)	W	R
Burst (Mux Add/Data)	N	K
Serial (SPI)		F
Automotive Burst (Demux)	C	

Process Technology

B = 320 nm, Floating Gate Technology
C = 320 nm, Floating Gate Technology
D = 230 nm, Floating Gate Technology
G = 170 nm, Floating Gate Technology
H = 130 nm, Floating Gate Technology
J = 110 nm, Floating Gate Technology
M = 230 nm, MirrorBit™ Technology
N = 110 nm, MirrorBit Technology

Additional Ordering Options
Varies for each generic OPN (characters 1-9). Meaning is defined in each datasheet

Packing Type

0 = Tray
1 = Tube
2 = 7" Tape & Reel
3 = 13" Tape & Reel

Speed Option

Asynchronous (no CLK input)

"Speed Option" represents random access time (ns).

If greater than 100 ns, use the two leftmost digits.

Synchronous (CLK input)

"Speed Option" represents clock frequency (MHz). First digit represents 100s of MHz.

Second digit represents the speed between 0 and 99 MHz:

A	0-4	F	25-29	L	50-54	R	75-79
B	5-9	G	30-34	M	55-59	S	80-84
C	10-14	H	35-39	N	60-64	T	85-89
D	15-19	J	40-44	P	65-69	U	90-94
E	20-24	K	45-49	Q	70-74	W	95-99

Temperature Grade

E = Engineering Samples

C = Commercial (0 – 70 °C)

W = Wireless (-25 – 85 °C)

I = Industrial (-40 – 85 °C)

N = Extended (-40 – 125 °C)

Package Material Set (Varies by Package Type)

[BGA] A = Standard Not Lead (Pb)-Free

[BGA] F = Standard Lead (Pb)-Free

[Lead Frame] A = Standard Not Lead (Pb)-Free, Copper

[Lead Frame] F = Standard Lead (Pb)-Free, Copper, Sn

Package Type [Family]

B = BGA [BGA]

C = CSOP [Lead Frame]

D = Die [Die/Wafer]

E = Super CSP [BGA]

F = Fortified BGA [BGA]

M = SOIC/SOP [Lead Frame]

N = WSON [Lead Frame]

(Am)

Spansion™ Ordering Part Number Construction: Single-die Products

Generic OPN										Ordering Options								
Prefix	Series		Family			Density			Tech	Sector	Speed Option				Package		Temp	Option
Am	2	9	B	D	S	3	2	3	D	T	1	1	A	(R)	W	K	I	

Prefix
Am = Spansion™ memory originally developed by AMD

Product Series
29 = Sector Erase NOR Flash memory

Device Family
 BDS = 1.8V, SRW, Burst
 DS = 1.8V, SRW
 SL = 1.8V
 LV = 3V
 DL = 3V, SRW
 BL = 3V, Burst
 PL = 3V, Page
 PDL = 3V, SRW, Page
 F = 5V
 SRW = Simultaneous Read-Write

Density
Density is as noted in tables and data sheets. Digits broadly indicate device density. Bus width and organization vary by family.

Process Technology
 B: 320nm Floating Gate
 C: 320nm Floating Gate
 D: 230nm Floating Gate
 G: 170nm Floating Gate
 H: 130nm Floating Gate
 M: 230nm MirrorBit™

Sector Architecture and Sector Write Protection
 T = Top boot sector
 B = Bottom boot sector
 U/blank = Uniform sector
 H = Uniform sector, WP# protects highest addressed sector
 L = Uniform sector, WP# protects lowest addressed sector

Temperature Range
 C = Commercial (0° - 70°C)
 I = Industrial (-40° - 85°C)
 E = Extended (-55° - 125°C)

Optional Processing
 blank = standard
 N = ESN device

Speed Option, Voltage Regulation

1.8V Devices

**(*) = (SL,DS) 2 or 3 digits indicate speed in ns,
 $V_{CC} = 1.8\text{--}2.2\text{V}$.

**(*) = (BDS) 2 or 3 characters indicate clock rate,
asynchronous read access,
handshaking type.

3V Devices

**(*) = 2 or 3 digits indicate speed in ns,
device is full voltage range.

()1 = (LV64xD/G) First two digits indicate speed
in ns x 10. "1" indicates $V_{IO} < V_{CC}$.

** = (PDL) First digit is speed in ns x 10.
Last is V_{IO} range, 3 : $V_{IO} = 3\text{V}$, 8 : $V_{IO} = 1.8\text{V}$.

5V Devices

()0 = Ends in "0" - indicates speed in ns,
 $V_{CC} = 5.0\text{V} \pm 10\%$ (4.5-5.5V).

*5 = Ends in "5" - check table or data sheet for actual
speed and voltage range.

(F400) If part number has a "0" after the temperature
range, then $V_{CC} = 4.5\text{--}5.5\text{V}$.

"R" indicates regulated voltage range

Package Type

J = Rectangular Plastic Leaded Chip Carrier (PLCC)

K = 80-pin Plastic Quad Flat Package (PQFP) (PQR080)

P = Plastic Dual Inline Package (PDIP)

S = 44-pin Small Outline (SO) Package (SO 044)

SK = 44-pin Reverse Pinout Small Outline Package (SOR044)

Z = 56pin Shrink Small Outline Package (SSOP) (SSO056)

Thin Small Outline Packages (TSOP):

E = 32, 40, or 48Pin Standard Pinout (TS 048)

(for Am29F016/017 devices only,

E = 48-pin, E4 = 40-pin)

E2 = 40/44-pin Type-II Standard Pinout (TS 044)

F = 32, 40, or 48pin Reverse Pinout (TSR048)

(for Am29F016/017 devices only,

F = 48-pin, F4 = 40-pin)

F2 = 40/44-pin Type-II Reverse Pinout (TSR044)

Fine-Pitch Ball Grid Array Packages,

0.8 mm ball pitch (unless otherwise noted):

MA = 63-ball, 11 x 12 mm body (FSA063)

MD = 63-ball, 10.95 x 11.95 body (FSD063)

VA = 44-ball, 9.2 x 8 mm body, 0.5 mm pitch (VDA044)

VK = 80-ball, 11.5 x 9 mm body (VBB080)

VM = 64-ball, 8 x 9 mm (VBD064)

WA = 48-Ball, 6 x 8 mm body (FBA048)

WB = 48-Ball, 6 x 9 mm body (FBB048)

WC = 48-Ball, 8 x 9 mm body (FBC048)

WD = 63-Ball, 8 x 14 mm body (FBD063)

WG = 40-Ball, 8 x 15 mm body (FBE040)

WH = 63-Ball, 12 x 11 mm body (FBE063)

WK = 47-Ball, 7 x 10 mm body, 0.5 mm ball pitch (FDD047)

WL = 48-Ball, 11 x 10 mm body, 0.5 mm ball pitch (FDE048)

WM = 48-Ball, 6 x 12 mm body (FBD048)

WP = 84-Ball, 11 x 12 mm body (FBF084)

WS = 80-Ball, 11 x 12 mm body (FBE080)

Fortified Ball Grid Array Packages,

1.0 mm ball pitch (unless otherwise noted):

PA = 64-Ball, 13 x 11 mm body (LSA064)

PB = 80-Ball, 13 x 11 mm body (LAA080)

PC = 64-Ball 13 x 11 mm body (LAA064)

PE = 80-Ball, 10 x 15 mm body (LAB080)

PG = 64-Ball, 18 x 12 mm body (LAC064)

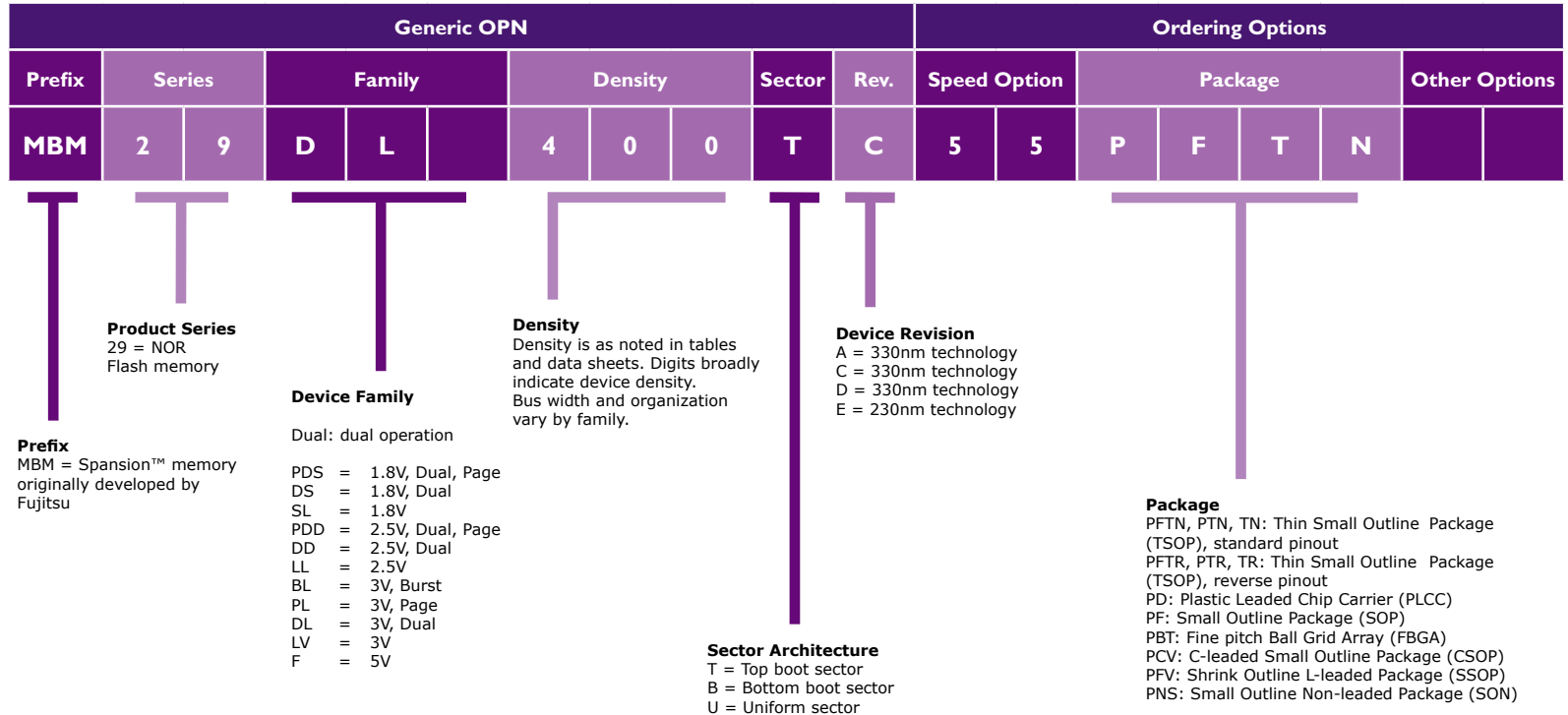
PH = 80-Ball, 13 x 11 mm body (LSB080)

PI = 80-Ball, 11 x 12 mm body (LSC080)

(MBM)

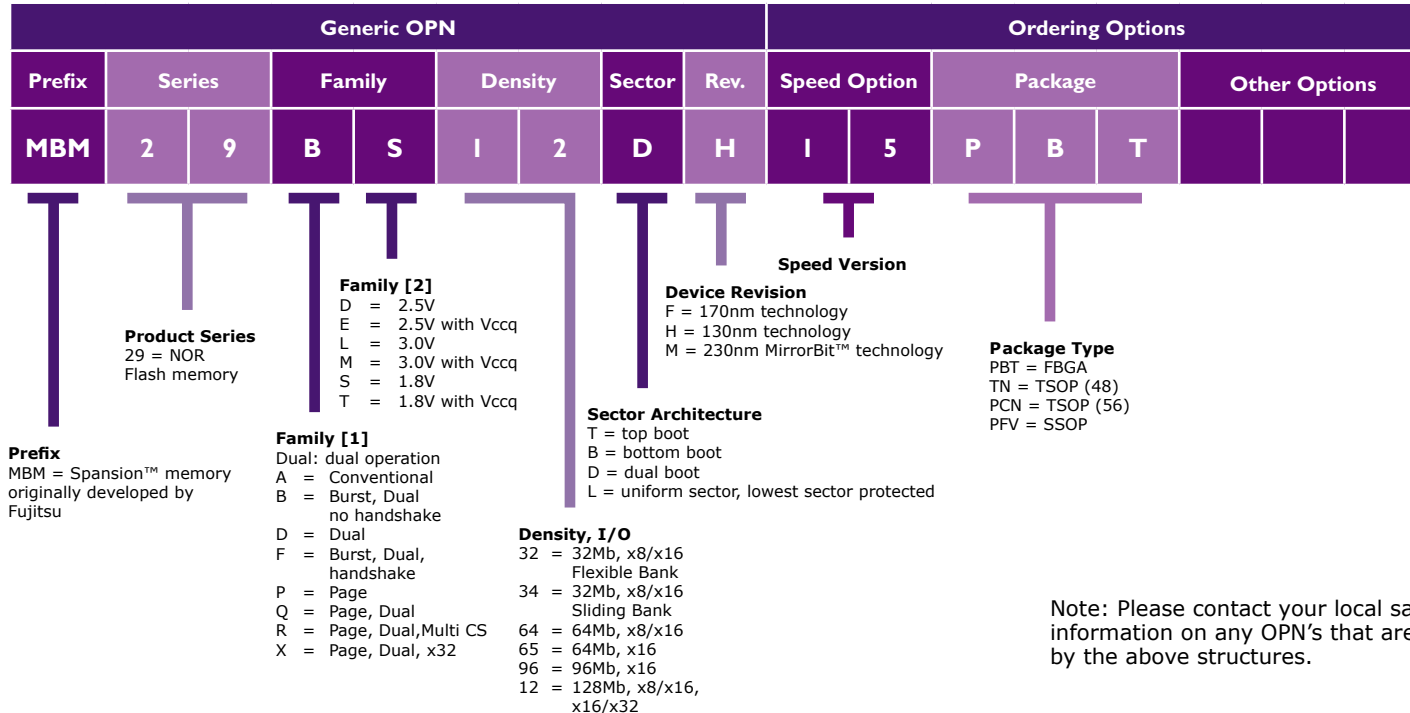


Spansion™ Ordering Part Number Construction: Single-die Products (230nm, 330nm technology)



(MBM)

Spansion™ Ordering Part Number Construction: Single-die Products (170nm technology and newer)



Software Tools

SpanSion™ Flash software supports your system designs by offering pre-developed, pre-integrated system level solutions and tailored solutions to meet specific needs.

Spansion software solutions help you achieve faster time-to-market, lower risk, and lower costs for your products.

Flash Software Overview

Contact your Spansion™ Flash memory representative or software@spansion.com for any of the following packages:

Superset Software Packages (SSP)

The SSP is **platform software** that provides a file system that can work with many operating systems (VxWorks, Windows® CE, QNX, Linux) and many types of Flash memory. The SSP is based upon M-Systems' market leading True Flash File System (TrueFFS). It provides power failure tolerance, wear-leveling, and automatic defragmenting.

Data Management Software (DMS)

The DMS is an **advanced silicon driver** for conventional and simultaneous read-write devices. The DMS provides a logical block abstraction of Flash erase sectors that is customized to the simultaneous read-write capability incorporated in select Spansion Flash memories.

Enhanced Flash Driver (EFD)

The EFD is an **advanced silicon driver**. The EFD provides RTOS awareness for single devices. EFD's virtual machine uses global mutually exclusive (mutex) data structures to coordinate sharing of individual Flash memory devices between multiple application threads.

Microsoft® Flash Media Driver (FMD)

The FMD is a **basic silicon driver** for floating gate and Flash memory devices based on MirrorBit™ technology. The FMD supports all device features and works with the Microsoft Windows CE operating system.

SPI Low Level Driver (SLLD)

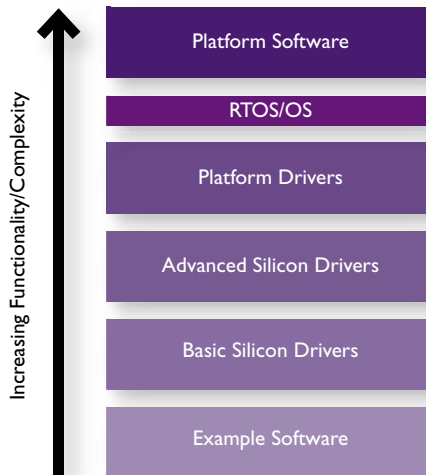
The SLLD is a **basic silicon driver** for SPI Flash devices. The SLLD supports all device features.

Low Level Driver (LLD)

The LLD is a complete **basic silicon driver** for floating gate and Flash memory devices based on MirrorBit technology.

CFI.c / FLASH.c

CFI.c and FLASH.c are **example software** that illustrate how to use the Flash memory feature set with the simplest, most direct implementation. The CFI.c driver is essentially the same as the basic FLASH.c driver, with the added capability of querying the device for its Common Flash Interface (CFI) information.



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Product Table Notes

Access Times

- All access times are listed in units of ns.
- For Page Mode devices, the notation can be read as:
max initial access time (max page read access time)
- For Burst Mode devices, the notation can be read as:
 $t_{ACC}/t_{IACC}/t_{BACC}@freq$
 t_{ACC} = max asynchronous access time (max address access time)
 t_{IACC} = max initial synchronous access time (max latency time)
 t_{BACC} = max burst access time
freq = burst frequency in MHz
- For Am29BL Burst Mode devices, the notation can be read as:
 $t_{ACC}/t_{ACC}/t_{BACC}$
 t_{ACC} = max asynchronous and synchronous access time
 t_{BACC} = max burst access time

Temperature

- C** = 0° to +70°C Commercial
- C2** = -20° to +70°C Commercial (MBM)
- I** = -40° to +85°C Industrial
- E** = -55° to +125°C Extended (Am)
- W** = -25° to +85°C Wireless (S)
- N** = -40° to +125°C Extended (S)
- D** = C with lead (Pb)-free package (Am)
- F** = I with lead (Pb)-free package (Am)
- K** = E with lead (Pb)-free package (Am)

Packages

Refer to Ordering Part Number tables to translate package codes. The notation can be read as:
package_code##, where ## indicates the number of pins/balls on the package.

Sector

- T** = top sector boot block configuration
- B** = bottom sector boot block configuration
- D** = dual boot block,
top and bottom boot sectors in same device
- U** = uniform sector device
- H** = uniform sector device,
highest address sector protected
- L** = uniform sector device,
lowest address sector protected

Features

- Sector notation can be read as:
Sectors(unit):#_of_sectors x size_of_sector, ...
- Bank notation can be read as:
Banks/Flexible Bank:bankA_size/bankB_size/... Mb
Information on sector organization within banks can be found in the device data sheet.
- WP# = Write Protect input pin
ACC = Accelerated programming input pin
- SecSi™ Sector is a one-time programmable sector. For MBM devices, it is called the HiddenRom™ region.
- For SPI products, W# pin works in conjunction with status register to protect specified memory areas.
- VersatileI/O allows the I/O voltage range to be set by the voltage level asserted on the V_{IO} pin. For MBM devices, VersatileI/O utilizes the V_{CCQ} pin.