



Migrating to the Macronix MX29LV400C/800C/160D/320D Flash Families
from Spansion S29AL004D/008D/016D/032D Devices.

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Introduction

This application note indicates the differences between Spansion S29AL004D/008D/016D/032D and Macronix MX29LV400C/800C/160D/320D. The information provided is based on the data available at the time. The MX29LV datasheet may override this application note if there is a different description for the same items in the datasheet.

General Feature Comparison

Table 1. General Feature Comparison of Parallel 4Mb devices

Part No	MX29LV400C		S29AL004D (Spansion)		
VCC Range	2.7~3.6V		2.7~3.6V		
Package	48-TSOP (12x20mm) 48-FGBA (6x8mm) 44-SOP (500mil)		48-TSOP (12x20mm) 48-FGBA (6x8mm) 44-SOP (500mil)		
Feature					
Sector Architecture	16KB+8KBx2+32KB + 64KBx7		16KB+8KBx2+32KB + 64KBx7		
Configuration	x8 /x16		x8 / x16		
Boot Block	Top/Botton		Top/Botton		
CFI(commom Flash interface)	Yes		No		
Unlock Bypass program	No		Yes		
Parameter		Typ.	Max.	Typ.	Max.
Access time (tAA)	ns		55/70/90		55/70/90
Byte Program Time	us	9	300	7	210
Chip Program Time(byte)	sec	4.5	13.5	4.2	12.5
Sector Erase Time	sec	0.7	15	0.7	10
Chip Erase Time	sec	4	32	11	
Erase/Program Cycle	Cycles	100K		1,000K	



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Table 2. General Feature Comparison of Parallel 8Mb devices

Part No	MX29LV800C		S29AL008D (Spansion)		
VCC Range	2.7~3.6V		2.7~3.6V		
Package	44-SOP (500mil) 48-TSOP (12x20mm) 48-FGBA (6x8mm)		44-SOP (500mil) 48-TSOP (12x20mm) 48-FGBA (6x8mm)		
Feature					
Sector Architecture	16KB+8KBx2+32KB+64KBx15		16KB+8KBx2+32KB+64KBx15		
Configuration	x8 /x16		x8 / x16		
Boot Block	Top/Bottom		Top/Bottom		
CFI(commom Flash interface)	Yes		No		
Unlock Bypass program	No		Yes		
Parameter		Typ.	Max.	Typ.	Max.
Access time (tAA)	ns		55R/70/90		55/70/90
Byte Program Time	us	9	300	7	300
Chip Program Time(Byte)	sec	2.3	6.8	8.4	25
Sector Erase Time	sec	0.5		0.5	
Chip Erase Time	sec	4	32	11	
Erase/Program Cycle	Cycles	100K		1000K	

Table 3. General Feature Comparison of Parallel 16Mb devices

Part No	MX29LV160D		S29AL016D (Spansion)		
VCC Range	2.7~3.6V		2.7~3.6V		
Package	44-SOP (500mil) 48-TSOP (12x20mm) 48-FGBA (6x8mm)		44-SOP (500mil) 48-TSOP (12x20mm) 48-FGBA (6x8mm)		
Feature					
Sector Architecture	16KB+8KBx2+32KB+64KBx31		16KB+8KBx2+32KB+64KBx31		
Configuration	x8 /x16		x8 / x16		
Boot Block	Top/Bottom		Top/Bottom		
CFI(commom Flash interface)	Yes		Yes		
Unlock Bypass program	No		Yes		
Security sector	No		256byte		
Parameter		Typ.	Max.	Typ.	Max.
Access time (tAA)	ns		70/90		70/90
Byte Program Time	us	9	300	7	210
Chip Program Time(Byte)	sec	18	54	11	33
Sector Erase Time	sec	0.7	2	0.7	10
Chip Erase Time	sec	15	32	25	
Erase/Program Cycle	Cycles	100K		1000K	



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Table 4. General Feature Comparison of Parallel 32Mb devices

Part No	MX29LV320D		S29AL032D (Spansion)		
VCC Range	2.7~3.6V		2.7~3.6V		
Package	48-TSOP (12x20mm) 48-TFGBA (6x8mm)		48-TSOP (12x20mm) 48-TFGBA (6x8mm)		
Feature					
Sector Architecture	16KB+8KBx2+32KB + 64KBx63		16KB+8KBx2+32KB + 64KBx63		
Configuration	x8 /x16		x8 / x16		
Boot Block	Top/Botton		Top/Botton		
CFI(commom Flash interface)	Yes		Yes		
Unlack Bypass program	No		Yes		
Security sector	256byte		256byte		
Parameter		Typ.	Max.	Typ.	Max.
Access time (tAA)	ns		70/90		70/90
Byte Program Time	us	9	300	9	300
Chip Program Time(Byte)	sec	36	108	36	108
Sector Erase Time	sec	0.7	2	0.7	10
Chip Erase Time	sec	35	50	45	
Erase/Program Cycle	Cycles	100K		1000K	



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Hardware Notices

MX29LV's Package and Pin Definition are compatible with S29AL devices, except the MX29LV160D device has WP#/ACC pin, while the S29AL016D has NC pin. The MX29LV160D's WP#/ACC pin has internal high impedance, if customers use it as NC pin, MX29LV160D can accept it and the WP#/ACC can be used as don't care pin.

High Voltage Vhv (Vhh)

The MX29LV160D/320D series offer Vhv (Vhh in S29AL) ranging from 9.5V to 10.5V; while S29AL offers Vhh from 11.5 to 12.5V

Software Notices

The MX29LV160D/320D products do not provide Unlock Bypass program mode, and the MX29LV004C/008C support the CFI (Common Flash Interface) feature. Other than that, the software commands are compatible with S29AL004D/008D/016D/032D products.

Table 5. Manufacturer ID comparison

	Macronix	Spansion
Features	MX29LV400C	S29LV004D
Manufacturer ID	00C2h	0001h
Device ID (T/B)	22B9h/22BAh	22B9h/22BAh

	Macronix	Spansion
Features	MX29LV800C	S29AL008D
Manufacturer ID	00C2h	0001h
Device ID (T/B)	22DAh/225Bh	22DAh/225Bh

	Macronix	Spansion
Features	MX29LV160D	S29AL016D
Manufacturer ID	00C2h	0001h
Device ID (T/B)	22C4h/2249hh	22C4h/2249hh

	Macronix	Spansion
Features	MX29LV320D	S29AL032D
Manufacturer ID	00C2h	0001h
Device ID (T/B)	22A7h/22A8h	22F6h/22F9h



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Summary

Macronix MX29LV hardware-wise is footprint compatible with Spansion S29AL devices even the hardware pin has slight differences; as well as the differences in V_{hv} range. On software perspective, please note the Unlock Bypass feature, Manufacture ID and Device ID differences.

In conclusion, Spansion S29AL devices could be converted to Macronix MX29LV devices with minor adjustment effort.

References

The following datasheets were used to prepare this comparative technical note.

Datasheet	Source	Date	Version
S29AL004D	web-site	June. 22, 2006	A5
S29AL008D	web-site	Nov. 27, 2007	A7
S29AL016D	web-site	Nov. 27, 2007	A10
S29AL032D	web-site	Nov. 2, 2006	A8

For functional and parametric specifications, refer to the product datasheets on the Macronix web site at <http://www.macronix.com/> and refer to the web page: Products / Flash Memory / Parallel Flash



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Revision History

Revision No.	Description	Page	Date
0.01	1. Added unlock bypass mode column in 4/8M. 2. Modified Spansion Erase/Program cycle from 100K to 1000K. 3. Modified byte/program time unit from ns to us.	P2 P1-4	APR/17/2009



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