



# **Migration Note**

## **Spansion Flash S29AL016D to Eon Flash EN29LV160B**



# Eon Silicon Solution Inc.

## 1. INTRODUCTION

The application note introduces how to implement a system design from Spansion S29AL016D Flash to Eon EN29LV160B Flash.

## 2. GENERAL FUNCTION COMPARISON TABLE:

The following table is major features of these two devices.

Features	EN29LV160B	S29AL016D
voltage range	2.7 ~ 3.6	2.7 ~ 3.6
Pin to Pin	compatible (for 48 TSOP) Compatible (for 48 TFBGA)	compatible (for 48 TSOP) Compatible (for 48 TFBGA)
Access time	70ns	70ns / 90ns
Secured Silicon Sector region	None	None
Sector Architecture	8K Byte x 2 sectors /16K Byte X 1 sector / 32K Byte X1 sector / 64K Byte X 31 sectors boot sectors at Top or Bottom	8K Byte x 2 sectors /16K Byte X 1 sector / 32K Byte X1 sector / 64K Byte X 31 sectors boot sectors at Top or Bottom
Byte/Word mode	Yes	Yes
VID and VHH Max	10.5V - 11.5V	11.5V - 12.5V
CFI Compliant	Yes	Yes
Erase Suspend/Resume	Yes	Yes
Continuous Sector Erasure	None	Yes
Minimum endurance cycle	100K	1,000K (typ.)
Package	48-pin 12mm x 20mm TSOP 48 ball 6mm x 8mm TFBGA	48-pin 12mm x 20mm TSOP 48 ball 6.15mm x 8.15mm FBGA 44 pin 28.2mm x 16mm SOP



## 3. HARDWARE CONSIDERATIONS

### 3.1 I<sub>CC</sub> comparison

Current	EN29LV160B		S29AL016D		Unit
	Typ	Max	Typ	Max	
Read I <sub>CC1</sub>	9	16	9	16	mA
Write I <sub>CC2</sub>	20	30	20	35	mA
Standby I <sub>CC3</sub>	1	5.0	0.2	5.0	μA

### 3.2 Max VID comparison

S29AL016D VID range is 11.5V and 12.5V. But EN29LV160B VID range is 10.5V~11.5V.

Any voltage level higher than 11.5V would damage the device, possibly.

## 4. SOFTWARE CONSIDERATIONS

Except manufacture ID, there is no difference in Device ID, and Autoselect functions for EN29LV160B and S29AL016D are the same.

### 4.1 Manufacturer, Device Identification and Autoselect Information

For EN29LV160B autoselect mode table

Description	CE#	OE#	WE#	A19 to A12	A11 to A10	A9 <sup>2</sup>	A8	A7	A6	A5 to A2	A1	A0	DQ8 to DQ15	DQ7 to DQ0	
Manufacturer ID: Eon	L	L	H	X	X	V <sub>ID</sub>	L	X	L	X	L	L	X	7FH	
							H <sup>1</sup>							1CH	
Device ID (top boot block)	Word	L	L	H	X	X	V <sub>ID</sub>	X	X	L	X	L	H	22h	C4H
	Byte	L	L	H										X	C4H
Device ID (bottom boot block)	Word	L	L	H	X	X	V <sub>ID</sub>	X	X	L	X	L	H	22h	49H
	Byte	L	L	H										X	49H
Sector Protection Verification	L	L	H	SA	X	V <sub>ID</sub>	X	X	L	X	H	L	X	01h (Protected)	
													X	00h (Unprotected)	

**Note:**

- A8=H is recommended for Manufacturing ID check. If a manufacturing ID is read with A8=L, the chip will output a configuration code 7Fh
- A9 = VID is for HV A9 Autoselect mode only. A9 must be ≤ V<sub>cc</sub> (CMOS logic level) for Command Autoselect Mode.



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For S29AL016D autoselect mode table

Description	Mode	CE#	OE#	WE#	A19 to A12	A11 to A10	A9	A8 to A7	A6	A5 to A4	A3 to A2	A1	A0	DQ8 to DQ15	DQ7 to DQ0
Manufacturer ID: Spansion		L	L	H	X	X	V <sub>ID</sub>	X	L	X	L	L	L	X	01h
Device ID: S29AL016D (Top Boot Block)	Word	L	L	H	X	X	V <sub>ID</sub>	X	L	X	L	L	H	22h	C4h
	Byte	L	L	H	X	X	V <sub>ID</sub>	X	L	X	L	L	H	X	C4h
Device ID: S29AL016D (Bottom Boot Block)	Word	L	L	H	X	X	V <sub>ID</sub>	X	L	X	L	L	H	22h	49h
	Byte	L	L	H	X	X	V <sub>ID</sub>	X	L	X	L	L	H	X	49h
Sector Protection Verification		L	L	H	SA	X	V <sub>ID</sub>	X	L	X	L	H	L	X	01h (protected)
														X	00h (unprotected)

L = Logic Low = V<sub>IL</sub>, H = Logic High = V<sub>IH</sub>, SA = Sector Address, X = Don't care.

## 4.2. Continuous Sector Erasure

The EN29LV160B doesn't support Continuous Sector Erasure function. Users must issue another sector erase command for the next sector to be erased after the previous one is completed for EN29LV160B.



## 5. PERFORMANCE DIFFERENCES

### 5.1 Power-on and Reset Timings

Parameter	Description	Test Setup	EN29LV160B	S29AL016D
t <sub>VCS</sub>	Vcc Setup Time	Min.	50µs	50µs
t <sub>RP1</sub>	RESET# Pulse Width (During Embedded Algorithms)	Min.	10us	10µs
t <sub>RP2</sub>	RESET# Pulse Width (NOT During Embedded Algorithms)	Min.	500ns	500ns
t <sub>RH</sub>	Reset# High Time Before Read	Min.	50ns	50ns
t <sub>RB1</sub>	RY/BY# Recovery Time ( to CE#, OE# go low)	Min.	0ns	0ns
t <sub>RB2</sub>	RY/BY# Recovery Time ( to WE# go low)	Min.	50ns	50ns
t <sub>READY1</sub>	Reset# Pin Low (During Embedded Algorithms) to Read or Write	Max.	20µs	20µs
t <sub>READY2</sub>	Reset# Pin Low (NOT During Embedded Algorithms) to Read or Write	Max.	500ns	500ns

### 5.2 ERASE AND PROGRAM PERFORMANCE

The erasing and programming performance comparison.

Parameter	EN29LV160B		S29AL016D		Unit	
	Typ	Max	Typ	Max		
Sector Erase Time	0.1	2	0.7	10	Sec	
Chip Erase Time	4	35	25	None*	Sec	
Byte Programming Time	8	200	7	210	µS	
Word Programming Time	8	200	7	210	µS	
Chip Programming Time	Byte	16.8	50.4	11	33	Sec
	Word	8.4	25.2	7.2	21.6	Sec

**Note\*:** There is no clear description in datasheet.



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## Revisions List

Revision No	Description	Date
A	Initial Release	2009/04/22