



# **Application Note**

**Eon Flash EN29LV320B**

**VS**

**Spansion Flash S29AL032D**



# Eon Silicon Solution Inc.

## 1. INTRODUCTION

The application note introduces how to implement a system design from Spansion S29AL032D Flash to Eon EN29LV320B Flash.

## 2. GENERAL FUNCTION COMPARISON TABLE:

The following table is major features of these two devices.

Features	EN29LV320B	S29AL032D
voltage range	2.7 ~ 3.6	2.7 ~ 3.6
Pin to Pin	compatible (for 48 TSOP)	compatible (for 48 TSOP)
Access time	70ns	70ns / 90ns
Secured Silicon Sector region	None	128 word
Sector Architecture	Boot sector models: 8K Byte x 8 sectors / 64K Byte X 63 sectors, boot sectors at Top or Bottom	Boot sector models: 8K Byte x 8 sectors / 64K Byte X 63 sectors, boot sectors at Top or Bottom Uniform sector models: 64K Byte X 64 sectors
Byte/Word mode	Yes	Only TSOP 48 support
WP#/ACC	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 6mm x 10mm FBGA 40 pin 10mm x 20mm SOP



## 3. HARDWARE CONSIDERATIONS

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

Current	EN29LV320B		S29AL032D		Unit
	Typ	Max	Typ	Max	
Read I <sub>CC1</sub>	9	16	9	16	mA
Write I <sub>CC2</sub>	20	30	15	35	mA
Standby I <sub>CC3</sub>	1	5.0	0.2	5.0	μA

### 3.2 Max VID comparison

S29AL032D VID range is 11.5V and 12.5V. But EN29LV320B 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 EN29LV320B and S29AL032D are the same.

### 4.1 Manufacturer, Device Identification and Autoselect Information

For EN29LV320B autoselect mode table

Description	CE#	OE#	WE#	A20 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>	H <sup>1</sup>	X	L	X	L	L	X	1Ch	
							L							7Fh	
Device ID (top boot sector)	Word	L	L	H	X	X	V <sub>ID</sub>	X	X	L	X	L	H	22h	F6h
	Byte	L	L	H										X	F6h
Device ID (bottom boot sector)	Word	L	L	H	X	X	V <sub>ID</sub>	X	X	L	X	L	H	22h	F9h
	Byte	L	L	H										X	F9h
Sector Protection Verification	L	L	H	SA	X	V <sub>ID</sub>	X	X	L	X	H	L	X	01h (Protected)	
													X	00h (Unprotected)	

L=logic low= V<sub>IL</sub>, H=Logic High= V<sub>IH</sub>, V<sub>ID</sub> = 11 ± 0.5V, X=Don't Care (either L or H, but not floating!), SA=Sector Addresses

**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 = V<sub>ID</sub> 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 S29AL032D autoselect mode table

Description	Mode	CE#	OE#	WE#	A21 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: S29AL032D (Model 00)	Byte	L	L	H	X	X	V <sub>ID</sub>	X	L	X	L	L	H	N/A	A3h
Device ID: S29AL032D (Model 03)	Word	L	L	H	X	X	V <sub>ID</sub>	X	L	X	L	L	H	22h	F6h
	Byte	L	L	H										X	F6h
Device ID: S29AL032D (Model 04)	Word	L	L	H	X	X	V <sub>ID</sub>	X	L	X	L	L	H	22h	F9h
	Byte	L	L	H										X	F9h
Sector Protection Verification		L	L	H	SA	X	V <sub>ID</sub>	X	L	X	L	H	L	X	01h (protected)
														X	00h (unprotected)
Secured Silicon Sector Indicator Bit (DQ7) (Model 00)		L	L	H	X	X	V <sub>ID</sub>	X	L	X	L	H	H	X	85 (factory locked)
														X	05 (not factory locked)
Secured Silicon Sector Indicator Bit (DQ7) (Model 03)		L	L	H	X	X	V <sub>ID</sub>	X	L	X	L	H	H	X	8D (factory locked)
														X	0D (not factory locked)
Secured Silicon Sector Indicator Bit (DQ7) (Model 04)		L	L	H	X	X	V <sub>ID</sub>	X	L	X	L	H	H	X	9D (factory locked)
														X	1D (not factory locked)

**Legend**

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 EN29LV320B 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 EN29LV320B.

## 4.3. Secured Silicon Sector region

**EN29LV320B: No support.**

**S29AL032D: Support 128 word.**



## 5. PERFORMANCE DIFFERENCES

### 5.1 Power-on and Reset Timings

Parameter	Description	Test Setup	EN29LV320B	S29AL032D
t <sub>VCS</sub>	Vcc Setup Time	Min.	50μs	50μs
t <sub>RP1</sub>	RESET# Pulse Width (During Embedded Algorithms)	Min.	10us	None*
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	None*
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	EN29LV320B		S29AL032D		Unit	
	Typ	Max	Typ	Max		
Sector Erase Time	0.1	2	0.7	10	sec	
Chip Erase Time	8	70	45	None*	sec	
Byte Programming Time	8	200	9	300	μs	
Word Programming Time	8	200	11	360	μs	
Chip Programming Time	Byte	33.6	100.8	36	108	sec
	Word	16.8	50.4	24	72	sec

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



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## Revisions List

Revision No	Description	Date
A	Initial Release	2009/10/19