



Application Note

Eon Flash

EN29SL800 vs EN39SL800



Eon Silicon Solution Inc.

1. INTRODUCTION

The application note introduces how to implement a system design from Eon EN29SL800 Flash to EN39SL800 Flash.

2. GENERAL FUNCTION COMPARISON TABLE:

The following table is major features of these two devices.

Features	EN29SL800	EN39SL800
voltage range	1.65 ~ 2.2	1.65 ~ 1.95
Pin to Pin	48-pin TSOP (Type 1) 48-ball 6mm x 8mm TFBGA 48-ball 5mm x 6 mm WFBGA	48-pin TSOP (Type 1) 48-ball 6mm x 8mm TFBGA (B4 = NC, F6 = NC) 48-ball 4mm x 6 mm WFBGA
Access time	70ns / 90ns	70ns / 90ns
Sector Architecture	16K Byte/8K Word x 1 sector + 8K Byte/4K Word X 2 sectors + 32K Byte/16K Word X1 sector + 64K Byte/32K Word X 15 sectors boot sectors at Top or Bottom	256 sectors of 2K word 16 blocks of 32-Kword
Byte/Word mode	Yes	48-ball TFBGA and WFBGA only support Word Mode
VID and VHH Max	9.0V – 11.0V	9.0V – 11.0V
CFI Compliant	None	Yes
Erase Suspend/Resume	Yes	Yes
Minimum endurance cycle	100K	100K
Package	48-pin TSOP (Type 1) 48-ball 6mm x 8mm TFBGA 48-ball 5mm x 6 mm WFBGA 48-ball 5mm x 6 mm WLGA	48-pin TSOP (Type 1) 48-ball 6mm x 8mm TFBGA (F6 = NC, B4 = NC) 48-ball 4mm x 6 mm WFBGA



3. HARDWARE CONSIDERATIONS

3.1 I_{CC} comparison

EN39SL800 has great improvement at Read active current to reduce power consumption.

Current	EN29SL800		EN39SL800		Unit
	Typ	Max	Typ	Max	
Read I _{CC1}	15	30	5	10	mA
Write I _{CC4}	15	30	15	25	mA
Standby I _{CC2}	0.2	5.0	0.2	5.0	μA

3.2 48-ball (6mm x 8mm) TFBGA package ball out comparison

Ball out	EN29SL800-90BIP	EN39SL800-70BIP
B4	RESET#	NC
F6	Byte#	NC

For EN39SL800-70BIP, all of the ball-out are the same as EN29SL800-90BIP except B4 and F6. Although EN39SL800-70BIP don't support the RESET# and Byte# function, but it can pin to pin compatible with SST39WF800A at the same time.

3.3 48-ball WFBGA package outline comparison

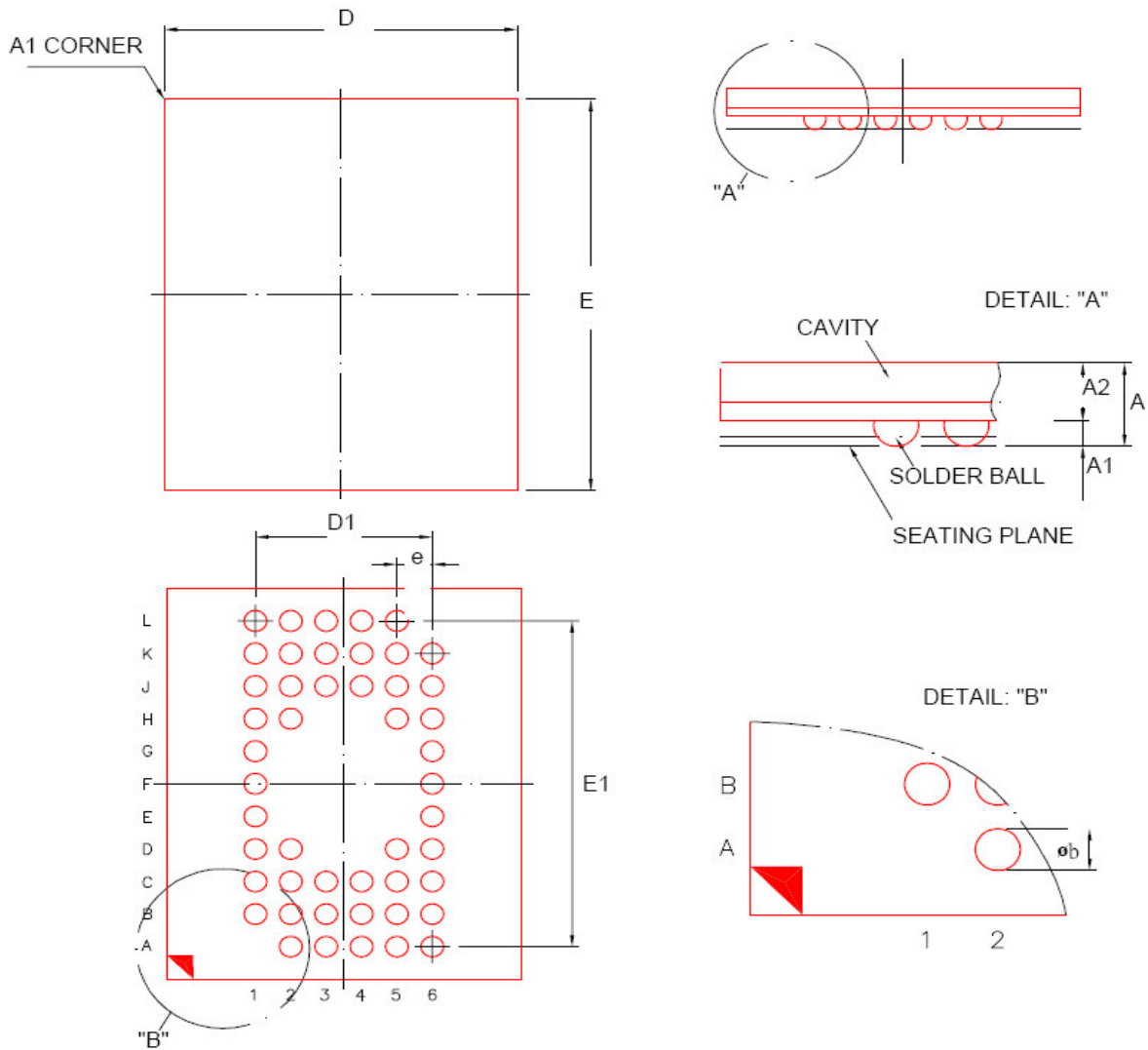
Part No.	EN29SL800-90MIP	EN39SL800-70NIP
Package Outline	(5mm x 6mm) WFBGA D = 5.0 ± 1	(4mm x 6mm) WFBGA D = 4.0 ± 1

For EN39SL800-70NIP, all of the parameters of 48-ball WFBGA package (for example: ball assignment, ball pitch, ball size and E dimension etc.) are the same as EN29SL800-90MIP except D dimension (from 5mm change to 4mm). But the customer also can replace EN29SL800-90MIP with EN39SL800-70NIP on PCB for system design directly.

The detail information please refers to the table and 48-ball WFBGA package outline are shown below.



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Part No.	EN29SL800-90MIP (5mm x 6mm) WFBGA D = 5.0 ± 1			EN39SL800-70NIP (4mm x 6mm) WFBGA D = 4.0 ± 1		
	DIMENSION IN MM			DIMENSION IN MM		
SYMBOL	MIN.	NOR	MAX	MIN.	NOR	MAX
A	---	---	0.73	---	---	0.73
A1	0.16	0.21	0.26	0.15	0.20	0.25
A2	---	0.436	---	---	0.436	---
D	4.90	5.00	5.10	3.90	4.00	4.10
E	5.90	6.00	6.10	5.90	6.00	6.10
D1	---	2.50	---	---	2.50	---
E1	---	5.00	---	---	5.00	---
e	---	0.50	---	---	0.50	---
øb	0.27	0.32	0.37	0.25	0.30	0.35

Note : 1. Coplanarity: 0.1 mm



4. SOFTWARE CONSIDERATIONS

Autoselect functions for EN29SL800 and EN39SL800 are the same except the device ID.

4.1 Manufacturer, Device Identification and Autoselect Information

For EN39SL800 autoselect mode table

Description	CE#	OE#	WE#	A18 to A12	A11 to A10	A9 ²	A8	A7	A6	A5 to A2	A1	A0	DQ8 to DQ15	DQ7 to DQ0
Manufacturer ID: Eon	L	L	H	X	X	V _{ID}	H ¹	X	L	X	L	L	X	1Ch
							L							7Fh
Device ID	L	L	H	X	X	V _{ID}	X	X	L	X	L	H	27h	3Fh
														Byte
Block Protection Verification	L	L	H	SA	X	V _{ID}	X	X	L	X	H	L	X	01h (Protected)
													X	00h (Unprotected)

For EN29SL800 autoselect mode table

Description	Mode	CE#	OE#	WE#	A18 to A12	A11 to A10	A9 ²	A8	A7	A6	A5 to A2	A1	A0	DQ8 to DQ15	DQ7 to DQ0
Manufacturer ID: Eon		L	L	H	X	X	V _{ID}	H ¹	X	L	X	L	L	X	1Ch
								L							7Fh
Device ID (top boot block)	Word	L	L	H	X	X	V _{ID}	X	X	L	X	L	H	22h	EAh
	Byte	L	L	H										X	EAh
Device ID (bottom boot block)	Word	L	L	H	X	X	V _{ID}	X	X	L	X	L	H	22h	6Bh
	Byte	L	L	H										X	6Bh
Sector Protection Verification		L	L	H	SA	X	V _{ID}	X	X	L	X	H	L	X	01h (Protected)
														X	00h (Unprotected)

Note:

1. If a manufacturing ID is read with A8=L, the chip will output a configuration code 7Fh. A further Manufacturing ID must be read with A8=H.
2. A9 = VID is for HV A9 Autoselect mode only. A9 must be ≤ V_{CC} (CMOS logic level) for Command Autoselect Mode.



4.2. Sector Architecture

EN39SL800:

Uniform Sector Architecture:

- 256 sectors of 2-Kword
- 16 blocks of 32-Kword
- Any sector or block can be erased individually

EN29SL800:

Flexible Sector Architecture:

- One 16-Kbyte, two 8-Kbyte, one 32-Kbyte, and fifteen 64-Kbyte sectors (byte mode)
- One 8-Kword, two 4-Kword, one 16-Kword, and fifteen 32-Kword sectors (word mode)

4.3. Sector Erasure

EN39SL800: Sector, Block or Chip erasable

EN29SL800: Sector or Chip erasable

Note : In the condition of erasing the boot sector of EN29SL800 to be replaced with EN39SL800, [one or several complete sector erase commands \[from cycle 1 ~ cycle 6 \(Addr./Data = SA/30h\)\]](#) must be issued in EN39SL800 depending on the sector size. The correlation table is shown below.



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Sector Size	Address Range (x16)	for cycle 6th	
		EN29SL800B	EN39SL800
8KWord	00000h-01FFFh	Issue sector erase (Addr./Data = SA/30h) for sector 0	Issue sector erase (Addr./Data = SA/30h) for sector 0
			Issue sector erase (Addr./Data = SA/30h) for sector 1
			Issue sector erase (Addr./Data = SA/30h) for sector 2
			Issue sector erase (Addr./Data = SA/30h) for sector 3
4KWord	02000h-02FFFh	Issue sector erase (Addr./Data = SA/30h) for sector 1	Issue sector erase (Addr./Data = SA/30h) for sector 4
			Issue sector erase (Addr./Data = SA/30h) for sector 5
4KWord	03000h-03FFFh	Issue sector erase (Addr./Data = SA/30h) for sector 2	Issue sector erase (Addr./Data = SA/30h) for sector 6
			Issue sector erase (Addr./Data = SA/30h) for sector 7
16KWord	04000h-07FFFh	Issue sector erase (Addr./Data = SA/30h) for sector 3	Issue sector erase (Addr./Data = SA/30h) for sector 8
			Issue sector erase (Addr./Data = SA/30h) for sector 9
			Issue sector erase (Addr./Data = SA/30h) for sector 10
			Issue sector erase (Addr./Data = SA/30h) for sector 11
			Issue sector erase (Addr./Data = SA/30h) for sector 12
			Issue sector erase (Addr./Data = SA/30h) for sector 13
			Issue sector erase (Addr./Data = SA/30h) for sector 14
			Issue sector erase (Addr./Data = SA/30h) for sector 15
32KWord	08000h-0FFFFh	Issue sector erase (Addr./Data = SA/30h) for sector 4	Issue sector erase (Addr./Data = SA/30h) for sector 16
			Issue sector erase (Addr./Data = SA/30h) for sector 17
			⋮
			Issue sector erase (Addr./Data = SA/30h) for sector 30
			Issue sector erase (Addr./Data = SA/30h) for sector 31
			Issue block erase (Addr./Data = BA/50h) for block 1

Note:

EN29SL800B is bottom sector, for EN29SL800T (top sector) the boot sectors are in high address.



5. PERFORMANCE DIFFERENCES

5.1 Power-on and Reset Timings

Parameter	Description	EN29SL800	EN39SL800
t _{VCS}	Vcc Setup Time	50μs	50μs
t _{RP1}	RESET# Pulse Width (During Embedded Algorithms)	None*	10μs
t _{RP2}	RESET# Pulse Width (NOT During Embedded Algorithms)	500ns	500ns
t _{RH}	Reset# High Time Before Read	50ns	50ns
t _{RB1}	RY/BY# Recovery Time (to CE#, OE# go low)	None*	0ns
t _{RB2}	RY/BY# Recovery Time (to WE# go low)	None*	50ns
t _{READY1}	Reset# Pin Low (During Embedded Algorithms) to Read or Write	20μs	20μs
t _{READY2}	Reset# Pin Low (NOT During Embedded Algorithms) to Read or Write	500ns	500ns

Note* : There is no description in datasheet.



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Revisions List

Revision No	Description	Date
A	Initial Release	2009/06/10