



Application Note

EON EN25Q32A

VS

MXIC KH25L3205D

Specification Comparison



Eon Silicon Solution Inc.

1. INTRODUCTION

The application note introduces how to implement a system design from MXIC KH25L3205D Flash to Eon EN25Q32A Flash.

2. GENERAL FUNCTION COMPARISON TABLE:

2.1 The following table highlights the major features of these two devices.

Features	EN25Q32A	KH25L3205D
Voltage Range	2.7 ~ 3.6	2.7 ~ 3.6
Pin to Pin Compatible (standard SPI mode)	8-pins SOP 200mil 8 contact VDFN 8-pins DIP	8-pins SOP 200mil 8-land WSON (6mmx5mm) 8-pins DIP
SPI frequency	100MHz (standard mode) 80MHz @ dual & quad mode	86MHz (standard mode) 50MHz @ dual mode
Secured Silicon Sector Region	512 Byte	512 bit
Sector Architecture	Uniform 1024 sectors of 4K byte 64 block of 64K byte	Uniform 1024 sectors of 4K byte 64 block of 64K byte
SPI mode	Mode 0 / Mode 3	Mode 0 / Mode 3
Minimum Endurance Cycle	100K	100K
Package	8-pins SOP 150mil 8-pins SOP 200mil 8 contact VDFN 8-pins DIP	8-pins SOP 200mil 16-pins SOP 300mil 8-land WSON (6mmx5mm) 8-pins DIP



3. HARDWARE CONSIDERATIONS

3.1 I_{CC} comparison

Current	EN25Q32A	KH25L3205D	Unit
	Max	Max	
Read I _{CC3}	25 @ 100MHz 20 @ 80MHz	25 @ 50/86MHz	mA
Page Program (PP) I _{CC4}	28	20	mA
Sector Erase (SE) I _{CC6}	25	20	mA
Standby I _{CC1}	20	20	μA

3.2 Pin Configuration (8-pin package)

Pin number	EN25Q32A	KH25L3205D
Pin1	CS#	CS#
Pin2	DO (DQ1)	SO / SIO1
Pin3	WP# (DQ2)	WP# / ACC
Pin4	VSS	GND
Pin5	DI (DQ0)	SI / SIO0
Pin6	CLK	SCLK
Pin7	NC (DQ3)	HOLD#
Pin8	VCC	VCC

Note:

1. Eon EN25Q32A Flash can support the general standard / dual / quad SPI mode (Need specific SPI controller), but don't support the acceleration (ACC) pin and HOLD# pin functions.
2. For the general standard / dual SPI mode, Eon EN25Q32A Flash is the same as MXIC KH25L3205D Flash if customer don't use the accelerated (ACC) pin and HOLD# pin functions.
3. MXIC KH25L3205D don't support the quad SPI mode.



4. SOFTWARE CONSIDERATIONS

4.1 Manufacturer, Memory Type & Device Identification (M7~M0: manufacture ID, D15~ID0: memory type, ID7~ID0: memory density) comparison.

For EN25Q32A

OP Code	(M7-M0)	(ID15-ID0)	(ID7-ID0)
ABh			15h
90h	1Ch		15h
9Fh	1Ch	3016h	

For KH25L3205D

Additional Features Part Name	Identifier			
	Device ID (command : AB hex)	Device ID (command : 90 hex)	Device ID (command : EF hex)	RDID (command: 9F hex)
KH25L3205D	15 (hex)	C2 15 (hex) (if ADD=0)	C2 15 (hex) (if ADD=0)	C2 20 16 (hex)



4.2. Instruction Set Comparison

4.2.1 Different Block Protection Area

EN25Q32A :

Status Register Content				Memory Content			
BP3 Bit	BP2 Bit	BP1 Bit	BP0 Bit	Protect Areas	Addresses	Density(KB)	Portion
0	0	0	0	None	None	None	None
0	0	0	1	Block 0 to 62	000000h-3FFFFFFh	4032KB	Lower 63/64
0	0	1	0	Block 0 to 61	000000h-3DFFFFh	3968KB	Lower 62/64
0	0	1	1	Block 0 to 59	000000h-3BFFFFh	3840KB	Lower 60/64
0	1	0	0	Block 0 to 55	000000h-37FFFFh	3584KB	Lower 56/64
0	1	0	1	Block 0 to 47	000000h-2FFFFFFh	3072KB	Lower 48/64
0	1	1	0	Block 0 to 31	000000h-1FFFFFFh	2048KB	Lower 32/64
0	1	1	1	All	000000h-3FFFFFFh	4096KB	All
1	0	0	0	None	None	None	None
1	0	0	1	Block 63 to 1	3FFFFFFh-010000h	4032KB	Upper 63/64
1	0	1	0	Block 63 to 2	3FFFFFFh-020000h	3968KB	Upper 62/64
1	0	1	1	Block 63 to 4	3FFFFFFh-040000h	3840KB	Upper 60/64
1	1	0	0	Block 63 to 8	3FFFFFFh-080000h	3584KB	Upper 56/64
1	1	0	1	Block 63 to 16	3FFFFFFh-100000h	3072KB	Upper 48/64
1	1	1	0	Block 63 to 32	3FFFFFFh-200000h	2048KB	Upper 32/64
1	1	1	1	All	000000h-3FFFFFFh	4096KB	All

KH25L3205D :

Status bit				Protect Level
BP3	BP2	BP1	BP0	32Mb
0	0	0	0	0(none)
0	0	0	1	1(1block, block 63th)
0	0	1	0	2(2blocks, block 62th-63th)
0	0	1	1	3(4blocks, block 60th-63th)
0	1	0	0	4(8blocks, block 56th-63th)
0	1	0	1	5(16blocks, block 48th-63th)
0	1	1	0	6(32blocks, block 32th-63th)
0	1	1	1	7(64blocks, all)
1	0	0	0	8(64blocks, all)
1	0	0	1	9(32blocks, block 0th-31th)
1	0	1	0	10(48blocks, block 0th-47th)
1	0	1	1	11(56blocks, block 0th-55th)
1	1	0	0	12(60blocks, block 0th-59th)
1	1	0	1	13(62blocks, block 0th-61th)
1	1	1	0	14(63blocks, block 0th-62th)
1	1	1	1	15(64blocks, all)



4.2.2 Different RDSR bit definition

EN25Q32A :

S7		S6	S5	S4	S3	S2	S1	S0
SRP Status Register Protect	OTP_LOCK bit (note 1)	WPDIS (WP# disable)	BP3 (Block Protected bits)	BP2 (Block Protected bits)	BP1 (Block Protected bits)	BP0 (Block Protected bits)	WEL (Write Enable Latch)	WIP (Write In Progress bit)
1 = status register write disable	1 = OTP sector is protected	1 = WP# disable 0 = WP# enable	(note 2)	(note 2)	(note 2)	(note 2)	1 = write enable 0 = not write enable	1 = write operation 0 = not in write operation
Non-volatile bit		Non-volatile bit	Non-volatile bit	Non-volatile bit	Non-volatile bit	Non-volatile bit	volatile bit	volatile bit

Note

1. In OTP mode, SRP bit is served as OTP_LOCK bit.
2. See the table "Protected Area Sizes Sector Organization".

KH25L3205D :

Bit 5 is used for BP3 (level of protected block).

Bit 6 is used for continuously program mode status.

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
SRWD (status register write protect)	Continuously program mode (CP mode)	BP3 (level of protected block)	BP2 (level of protected block)	BP1 (level of protected block)	BP0 (level of protected block)	WEL (write enable latch)	WIP (write in progress bit)
1 = status register write disable	0 = normal program mode 1 = CP mode (default 0)	(note1)	(note1)	(note1)	(note1)	1 = write enable 0 = not write enable	1 = write operation 0 = not in write operation
Non-volatile bit	volatile bit	Non-volatile bit	Non-volatile bit	Non-volatile bit	Non-volatile bit	volatile bit	volatile bit

note1: see the table "Protected Area Sizes"

4.2.3 Security Register Definition

EN25Q32A: No support.

KH25L3205D : Support.

bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
x	x	x	x	x	x	LDSD (Indicate if lock-down)	Secured OTP indicator bit
reserved	reserved	reserved	reserved	reserved	reserved	0 = not lock-down 1 = lock-down (cannot program/erase OTP)	0 = non-factory lock 1 = factory lock
volatile bit	volatile bit	volatile bit	volatile bit	volatile bit	volatile bit	non-volatile bit	non-volatile bit



4.2.4 CP (Continuously Program mode) command

EN25Q32A: No support.

KH25L3205D : Support. (ADh)

4.2.5 RES (Read electronic ID) command

EN25Q32A: No support.

KH25L3205D : Support. (ABh)

4.2.6 REMS2 (Read ID for 2x I/O mode) command

EN25Q32A: No support.

KH25L3205D : Support. (EFh)

4.2.7 Enter Secured OTP command

EN25Q32A: Support. (3Ah)

KH25L3205D : Support. (B1h)

4.2.8 Exit Secured OTP command

EN25Q32A: Support. (04h)

KH25L3205D : Support. (C1h)

4.2.9 Secured OTP Addresses

EN25Q32A:

Sector	Sector Size	Address Range
1023	512 byte	3FF000h – 3FF1FFh

Note: The OTP sector is mapping to sector 1023

KH25L3205D :

Addressrange	Size	Standard Factory Lock	Customer Lock
xxxx00~xxxx0F	128-bit	ESN (electrical serial number)	Determined by customer
xxxx10~xxxx3F	384-bit	N/A	



4.2.10 RDSCUR (Read Security register) command

EN25Q32A: No support.

KH25L3205D : Support. (2Bh)

4.2.11 WRSCUR (Write Security register) command

EN25Q32A: No support.

KH25L3205D : Support. (2Fh)

4.2.12 ESRY (Enable SO to output RY/BY#) command

EN25Q32A: No support.

KH25L3205D : Support. (70h)

4.2.13 DSRY (Disable SO to output RY/BY#) command

EN25Q32A: No support.

KH25L3205D : Support. (80h)



5. PERFORMANCE DIFFERENCES

5.1 ERASE AND PROGRAM PERFORMANCE

The erasing and programming performance comparison.

Parameter	EN25Q32A		KH25L3205D		Unit
	Typ	Max	Typ	Max	
Block Erase Time	0.5	2	0.7	2	sec
Sector Erase Time	0.09	0.3	0.09	0.15	sec
Chip (Bulk) Erase Time	25	50	25	50	sec
Page Programming Time	1.3	5	1.4	5	ms

5.2 KEY AC PARAMETER PERFORMANCE

Parameter	EN25Q32A	KH25L3205D
tCH (serial clock high time)	Min @ 4ns	Min @ 7ns
tCL (serial clock low time)	Min @ 4ns	Min @ 7ns
tCLCH(serial clock rise time)	Min @ 0.1V / ns	Min @ 0.1V / ns
tCLCL(serial clock fall time)	Min @ 0.1V / ns	Min @ 0.1V / ns
tCHSH(CS# active setup / hold time)	Min@ 5ns	Min @ 5ns
tSHSL(CS# high time)	Min, read @ 15ns Program/Erase @ 50ns	Min @ 100ns
tDSU(Data in setup time)	Min @ 2ns	Min @ 2ns
tDH(Data in hold time)	Min @ 5ns	Min @ 5ns



Eon Silicon Solution Inc.

Revisions List

Revision No	Description	Date
A	Initial Release	2010/01/11