Comparison of MX25U4033E and MX25U4035

1. Introduction

This application note compares MX25U4033E and MX25U4035. The document does not provide detailed information on individual devices, but highlights the similarities and differences between them. The comparison covers the general features, performance, command set and device ID.

In comparison with MX25U4035, MX25U4033E supports more functions such as

- SFDP
- Individual Block/Sector Protect
- Non-Volatile Block Protection Bits
- Quad I/O Page Program
- Higher speed Normal Read and Fast Read

The information provided is based on the data available at the time. MX25U4033E and MX25U4035 datasheets may override this application note if there is a different description for the same specifications in the datasheets.

Please refer to the contents and comparison tables below for more details.

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2. General Features

2-1. Feature Comparison

Except the new features described in the introduction, MX25U4033E does not have RESET# pin function and does not support CP (Continuous Program) mode.

The SFDP is one of the new features of the MX25U4033E, which provides a consistent method of describing the features and functional capabilities of this Serial Flash device. User or host system can read the SFDP to understand the capabilities of the MX25U4033E for more efficient control. SFDP is a standard of JEDEC, JESD216 for serial flash. It is similiar to JEDEC Standard, JESD68 on CFI (Common Flash Interface) for Parallel Flash.

For the difference between these products, please check the comparison tables below for details.

Table 2-1. Feature Comparison

Part Number	MX25U4035	MX25U4033E
Voltage	1.65V -- 2.0V	1.65V -- 2.0V
Density	4Mb	4Mb
Package	150mil 8-SOP 6x5mm 8-WSON 4x4mm 8-USON	150mil 8-SOP 6x5mm 8-WSON 4x4mm 8-USON
Block	32KB & 64KB	32KB & 64KB
Input/Output	x1, x2, x4	x1, x2, x4
OTP Block Size	512bit	4Kbit
Hold# pin	Yes	Yes
RESET# pin	Yes (Share the same pin with Hold#, default RESET#)	--
Clock rate (Fast Read)	1 I/O: 40MHz 2 I/O: 40MHz 4 I/O: 33MHz	1 I/O: 80MHz 2 I/O: 80MHz 4 I/O: 70MHz
Clock rate (Normal Read)	25MHz	50MHz
BP Protect Area	User can select higher 1/2, 1/4, 1/8, or lower 1/2, 1/4, 1/8 or all of memory to protect	User can select higher 1/2, 1/4, 1/8 or lower 1/2, 3/4, 7/8 or all of memory to protect
Block Protection Bits: BP0~BP3	Volatile	Non-Volatile
QE Bit	Volatile	Non-Volatile
SRWD Bit	Volatile	Non-Volatile
Individual Block/Sector Protect	--	Yes
CP (Continuous Program mode)	Yes	--

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2-2. Performance Comparison

Table below is the comparison of new product and the former products.

Table 2-2: Performance Comparison

Parameter			MX25U4035	MX25U4033E
Clock High/ Low Time	tCH	Serial (fSCLK)	10ns(min.)	6ns(min.)
		Normal Read (fRSCLK)	16ns(min.)	9ns(min.)
		Others	12ns(min.)	7ns(min.)
	tCL	Serial (fSCLK)	10ns(min.)	6ns(min.)
		Normal Read (fRSCLK)	16ns(min.)	9ns(min.)
		Others	12ns(min.)	7ns(min.)
Program Time	Byte		30us (typ.); 300us (max.)	15us(typ.); 30us(max.)
	Page		2ms (typ.); 7ms (max.)	1.2ms(typ.); 3ms(max.)
Erase Time	Sector(4KB)		90ms (typ.); 2000ms (max.)	60ms (typ.); 200ms (max.)
	Block(32KB)		800ms(typ.); 1600ms (max.)	250ms(typ.); 1000ms (max.)
	Block(64KB)		1.5s(typ.); 3s (max.)	0.5s(typ.); 2s (max.)
	Chip		7.5s(typ.); 13s(max.)	2.5s(typ.); 5s(max.)
Read ID	tRES1		8.8us(max.)	10us(max.)
	tRES2		8.8us(max.)	10us(max.)
CS# Deselect Time	tSHSL		30ns(min.)	Read = 12ns(min.) Write = 30ns(min.)
CS# Active Setup Time	tSLCH		fRSCLK: 16ns fTSCLK: 12ns fSCLK: 8ns	7ns(min.)
CS# Not Active Setup Time	tSHCH		10ns(min.)	7ns(min.)
CS# Active Hold Time	tCHSH		fRSCLK: 16ns fTSCLK: 12ns fSCLK: 8ns	5ns(min.)
CS# Not Active Hold Time	tCHSL		10ns(min.)	5ns(min.)
VCC Standby Current	ISB1		1uA (typ.); 5uA (max.)	25uA (typ.); 35uA (max.)
Deep Power Down Current	ISB2		1uA (typ.); 5uA (max.)	3uA (typ.); 8uA (max.)
Active Current	ICC1 (Read)		12mA(max.) @40MHz 6mA(max.) @25MHz	12mA(max.) @80MHz 7mA(max.) @33MHz
	ICC2 (PP)		22 mA(max.)	25 mA(max.)
	ICC3 (WRSR)		22 mA(max.)	20 mA(max.)
	ICC4 (SE/BE/BE32K)		22 mA(max.)	25 mA(max.)
	ICC5 (CE)		22 mA(max.)	25 mA(max.)

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3. Command Set Comparison

User has to check the differences in detail by comparison table below. For the details of command sets function, please refer to the datasheet of each product.

Table 3. Command Set Comparison

Command Type	Command	Description	MX25U4035	MX25U4033E
Read	RDSFDP	Read SFDP	--	5Ah
Program	CP	Continuous Program	ADh	--
SO output	ESRY	Enable SO to Output RY/BY#	70h	--
	DSRY	Disable SO to Output RY/BY#	80h	--
Block Lock	SBLK	Single Block Lock	--	36h
	SBULK	Single Block Unlock Protection	--	39h
	GBLK	Gang Block Lock	--	7Eh
	GBULK	Gang Block Unlock	--	98h
Block Protect	RDBLOCK	Read Block Lock Status	--	3Ch
Hold#	HDE	HOLD# Enable	AAh*	--**

Note:

** For MX25U4035, default funciton of RESET#/HOLD#/SIO3 pin is RESET#. Use this command to enable HOLD# funciton.*

***For MX25U4033E, default funciton of HOLD#/SIO3 pin is HOLD#. Extra command to enable HOLD# function is not required.*

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4. Device ID Code Comparison

The following tables show that the Manufacturer and Device IDs have not changed.

Table 4-1: ID Code Comparison

Command Type	MX25U4035			MX25U4033E		
RDID	Manufac-tory ID	Type	Density	Manufac-tory ID	Type	Density
	C2	25	33	C2	25	33
RES	Electronic ID			Electronic ID		
	33			33		
REMS/REMS2/ REMS4	Manufactory ID		Device ID	Manufactory ID		Device ID
	C2		33	C2		33

5. References

The following datasheets were used for preparing this comparison note:

Datasheet	Location	Date Issued	Versions
MX25U4033E	Macronix Website	Nov. 10, 2011	0.00
MX25U4035	Macronix Website	Jul. 23, 2010	1.4

For more functional and parametric specifications, please refer to the datasheet on the Macronix Website at http://www.macronix.com/ and go to: Products/Flash Memory/Serial Flash.

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