

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.

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 similar 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 | -- |

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.) | |

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 function of RESET#/HOLD#/SIO3 pin is RESET#. Use this command to enable HOLD# function.

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

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 | | |
|----------------------|---------------------|------|-----------|---------------------|------|-----------|
| | Manufac- tory ID | Type | Density | Manufac- tory ID | Type | Density |
| RDID | 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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