Macronix MX25Lxx35E/F and MX25Lxx75E/F comparison

1. Introduction

Macronix offers MX25Lxx35E/F multi-I/O serial flash in densities from 16Mb to 256Mb. The default I/O mode is Single and Dual I/O only. To enable Quad I/O, HOLD# and WP# must be re-tasked from control inputs to data I/O pins by setting QE=1 (Status Register bit-6). However, some applications may require Quad I/O as the default mode, so Macronix now offers MX25Lxx75E/F from 32Mb to 128Mb with QE preset to '1' . The MX25Lxx35E/F and MX25Lxx75E/F are identical in all ways except the default QE bit status. This application note explains this difference in more detail.

2. Status Register Comparison

Both flash families have identical function--only Status Register bit-6 (QE) has a different default setting before shipping.

Status Register bit		Macronix 25Lxx35E/F	Macronix 25Lxx75E/F
Bit 0	WIP 1 = write operation	0	0
Bit 1	WEL 1 = write enable	0	0
Bit 2	BP0 Level of protected block	0	0
Bit 3	BP1 Level of protected block	0	0
Bit 4	BP2 Level of protected block	0	0
Bit 5	BP3 Level of protected block	0	0
Bit 6	QE *Quad I/O Enable = 1* *Quad I/O Disable = 0*	0	1
Bit 7	SRWD 1 = status register write disable	0	0

3. Quad Mode Introduction (QE bit setting)

When QE (Status Register bit-6) is set to '1', Quad I/O mode is enabled. WP# and HOLD# functions are re-tasked as data I/O pins only. In other words, HPM (hardware protection) and hold functions can't be used in Quad I/O mode. If the system requires either function, it may set QE=0 to return to Single and Dual I/O mode only.

Note: The QE bit (SR.6) is non-volatile and can be set or cleared by the customer or programmer at any time by using the WRSR command (01h).

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4. QE Bit of MX25Lxx75E/F Usage in Application

The default QE bit value of the MX25Lxx75E/F is '1'. If the system needs Quad I/O mode to be set permanently, there is no need to change the default QE bit value. However, if WP# or Hold# functions are needed at any time, they can be re-enabled by setting the QE bit to '0'. Please note that if WP# or Hold# functions are not needed and Quad I/O mode is not used, Single I/O and Dual I/O modes still work with the default setting of QE=1. There is no need for the system to change the default QE bit setting.

Figure 1 and Figure 2 show 4 x I/O mode and Quad I/O mode waveforms. When either I/O mode is used, WP# and Hold# pins are used as data I/O pins only. Their original hardware input control functions are disabled and will not be active until QE bit is cleared to '0'.

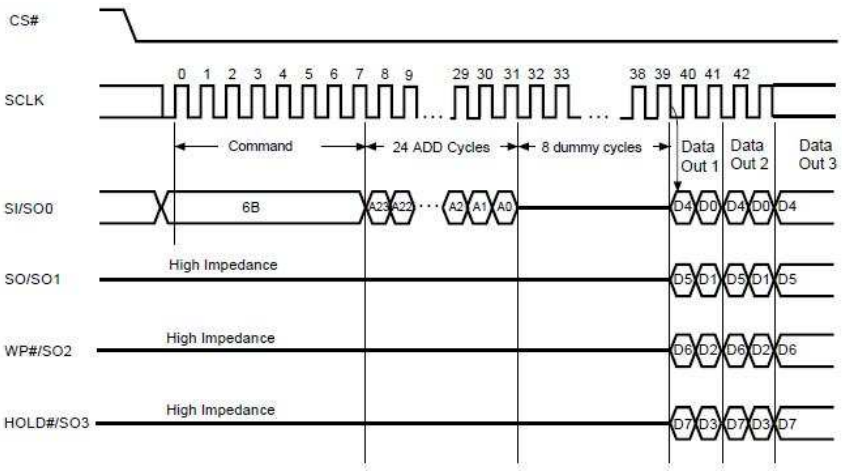


Figure1: 4xI/O mode (1-1-4 mode) wavefrom

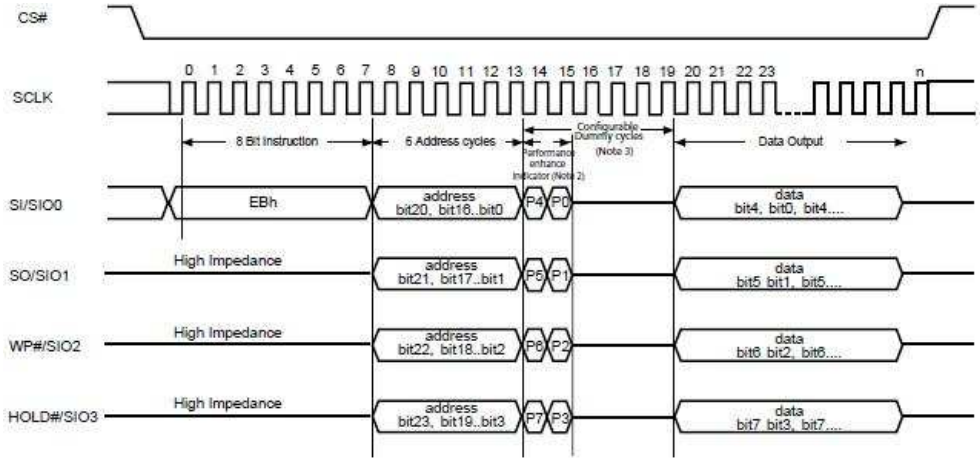


Figure2: Quad I/O mode (1-4-4 mode) waveform

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5. Summary

Macronix MX25Lxx35E/F and MX25Lxx75E/F have identical functions and performance. Their usage depends on the application requirement; select MX25Lxx75E/F for those applications needing Quad I/O mode as the factory default setting.

6. Appendix

The table will show cross device between MX25Lxx35E/F and MX25Lxx75E/F.

Density	MX25Lxx35E/F (default: QE = 0)	MX25Lxx75E/F (default: QE = 1)	Package
32Mb	MX25L3235EMI-10G	MX25L3275EMI-10G	300mil 16-SOP
	MX25L3235EM2I-10G	MX25L3275EM2I-10G	209mil 8-SOP
	MX25L3235EZNI-10G	MX25L3275EZNI-10G	6x5mm 8-WSON
64Mb	MX25L6435EMI-10G	MX25L6475EMI-10G	300mil 16-SOP
	MX25L6435EM2I-10G	MX25L6475EM2I-10G	209mil 8-SOP
	MX25L6435EZNI-10G	MX25L6475EZNI-10G	6x5mm 8-WSON
128Mb	MX25L12835FMI-10G	MX25L12875FMI-10G	300mil 16-SOP
	MX25L12835FM2I-10G	MX25L12875FM2I-10G	209mil 8-SOP
	MX25L12835FZNI-10G	MX25L12875FZNI-10G	6x5mm 8-WSON
	MX25L12835FZ2I-10G	MX25L12875FZ2I-10G	8x6mm 8-WSON

7. Data Sheet Version

The following data sheets are used for comparison in this application note.

Data sheet	Location	Date Issue	Revision
MX25L3235E	Website	May. 07, 2012	Rev. 1.0
MX25L3275E	Website	Apr. 24, 2012	Rev. 0.00
MX25L6435E	Website	Apr. 19, 2012	Rev. 0.05
MX25L6475E	Website	Apr. 24, 2012	Rev. 0.00
MX25L12835F	Website	Apr. 17, 2012	Rev. 0.01
MX25L12875F	Website	Jun. 15, 2012	Rev. 0.00

Note:

1. *Macronix data sheet is subject to change without notice.*
2. *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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