

Addendum

Valid Blocks and Boot Block Protection MT29F Series NAND Flash Memory

Introduction

This data sheet addendum specifies that blocks 00h to 07h are guaranteed valid with ECC when shipped from the factory.

NAND devices are shipped with all blocks unprotected and with standard access to perform READ, PROGRAM, and ERASE operations.

Block protection is enabled by the PROTECT command which inhibits PROGRAM and ERASE operations on up to twelve groups, or a total of 48 blocks.

Block protection is non-volatile. Therefore, a power-on or power-off sequence does not affect the block status after the PROTECT command is issued. The device ships from the factory with no blocks protected so that users can program or erase the blocks before issuing the PROTECT command. Block protection is also irreversible in that when protection is enabled by the issuing PROTECT command, the protected blocks can no longer be programmed or erased.

This addendum does not provide detailed information on the devices. The standard component data sheets provide a complete description of device functionality, operating modes, and specifications unless specified herein.

Address Blocks

Table 1: Valid Blocks

Parameter	Symbol	Device	Min	Max	Unit	Notes
Valid block number	NVB	MT29F1G08ABAFWP-IT:G	1004	1024	Blocks	1, 2
		MT29F1G08ABAF4H4-IT:G				
		MT29F1G08ABBFAH4-IT:G				
		MT29F2G08ABAF4H4-ITS:F	2008	2048		
		MT29F2G08ABAF4H4-S:F				
		MT29F2G08ABAGAWP-IT:G				
		MT29F2G08ABAGAH4-IT:G				
		MT29F2G08ABBGAH4-IT:G				
		MT29F4G08ABAEAH4-ITS:E	4016	4096		
		MT29F4G08ABAEAH4-S:E				
		MT29F8G08ABACAH4-ITS:C	8032	8192		
		MT29F8G08ABACAH4-S:C				

- Notes:
- Invalid blocks are blocks that contain one or more bad bits. The device may contain bad blocks upon shipment. Additional bad blocks may develop over time; however, the total number of available blocks will not drop below NVB during the endurance life of the device. Do not erase or program blocks marked invalid by the factory.
 - Blocks 00h to 07h are guaranteed to be valid with ECC when shipped from the factory.

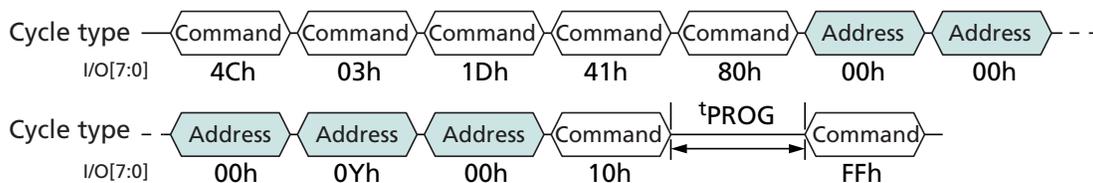
PROTECT Command

The PROTECT command provides non-volatile, irreversible protection of up to twelve groups, a total 48 blocks. Implementation of the protection is group based, which means that a minimum of one group (4 blocks) is protected when the PROTECT command is issued. The PROTECT command includes the steps included in the Address and Data Cycles table and the Protection Command Details.

(4Ch-03h-1Dh-41h)-80h-addr(00h-00h-00h-0Yh-00h)-10h-^tPROG-FFh

These steps are also shown in the Command Definitions – Address and Data Cycles table, followed by some details of the steps.

Figure 1: Address and Data Cycles



- Note:
- In the 4th address cycle, 0Yh is the last 4 bits and represents the group of blocks to be protected. There are always 12 groups, so Y = 0000b-1011b: Y = 0000 protects Group0 =

blks 0, 1, 2, 3; Y = 0001 protects Group1 = blks 4, 5, 6, 7; Y = 1011 protects Group11 = blks 44, 45, 46, 47.

PROTECTION Command Details

To enable protection, four bus write cycles set up the 4Ch, 03h, 1Dh, and 41h commands. Next, one bus write cycle sets up the PAGE PROGRAM command (80h).

Then, five bus write cycles are required to input the targeted block group information: 00h, 00h, 00h, 0Yh, 00h. In this 4th address cycle, 0Yh is the last 4 bits and represents the group of blocks to be protected. There are always 12 Groups, so Y = 0000b-1011b:

- Y = 0000 protects Group0 = blks 0, 1, 2, 3
- Y = 0001 protects Group1 = blks 4, 5, 6, 7
- Y = 1011 protects Group11 = blks 44, 45, 46, 47

One bus cycle is required to issue the PAGE PROGRAM CONFIRM command. After ^tProg, the targeted block groups are protected. The EXIT PROTECTION command (FFh) is issued to ensure the device exits protection mode.

(4Ch-03h-1Dh-41h)-80h-addr(00h-00h-00h-0Yh-00h)-10h-^tPROG-FFh

The enable protection step is four bytes wide to prevent implementing involuntary protection. In addition, any spurious command/address/data cycles between each byte invalidates the entire process and the next PROGRAM command does not affect the block protection status. Likewise, any spurious command/address/data cycle between enable protection and setting up the PAGE PROGRAM command invalidates the entire protection command process.

If enable protection is followed by an operation other than the PROGRAM operation, such as a PAGE READ or BLOCK ERASE operation, this other operation is executed without affecting block protection status. Therefore, the PROTECT operation must still be executed to protect the block. The PROTECT operation is inhibited if WP# is LOW. Upon PROTECT operation failure, the status register reports a value of E1h. Upon PROTECT operation success, the status register reports value of E0h.

The following is an example of boot block protection:

Protect group 5 (blks20-23): (4Ch-03h-1Dh-41h)-80h-addr(00h-00h-00h-05h-00h)-10h-^tPROG-FFh



Revision History

Rev. D – 1/16

- Updated device numbers in Table 1

Rev. C – 6/12

- Updated device numbers in Table 1

Rev. B – 2/12

- Added valid block information

Rev. A – 2/12

- Initial creation.

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