

Stacked MCP (Multi-Chip Package) FLASH MEMORY & SRAM

CMOS

**32M (× 8/×16) FLASH MEMORY &
4M (× 8/×16) STATIC RAM****MB84VD2218X-10/MB84VD2219X-10****MB84VD2218XA-10/MB84VD2219XA-10****■ FEATURES**

- **Power supply voltage** of 2.7 to 3.6 V
- **High performance**
100ns maximum access time (Flash)
85 ns maximum access time (SRAM)
- **Operating Temperature**
–25 to +85°C
- **Package** 77-ball BGA

1. FLASH MEMORY

- **Simultaneous Read/Write operations (dual bank)**
Multiple devices available with different bank sizes
Host system can program or erase in one bank, then immediately and simultaneously read from the other bank
Zero latency between read and write operations
Read-while-erase
Read-while-program
- **Minimum 100,000 write/erase cycles**
- **Sector erase architecture**
Eight 4 K words and sixty three 32 K words.
Any combination of sectors can be concurrently erased. Also supports full chip erase.
- **Boot Code Sector Architecture**
MB84VD2218X: Top sector
MB84VD2219X: Bottom sector
- **Embedded Erase™ Algorithms**
Automatically pre-programs and erases the chip or any sector
- **Embedded Program™ Algorithms**
Automatically writes and verifies data at specified address
- **Data Polling and Toggle Bit feature for detection of program or erase cycle completion**
- **Ready-Busy output (RY/BY)**
Hardware method for detection of program or erase cycle completion
- **Automatic sleep mode**
When addresses remain stable, automatically switch themselves to low power mode.
- **Low V_{CC} write inhibit ≤ 2.5 V**

(Continued)

MB84VD2218X/2218XA/2219X/2219XA-10

(Continued)

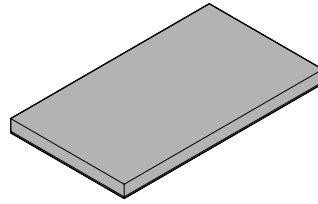
- **Hidden ROM (Hi-ROM) region**
64K byte of Hi-ROM, accessible through a new “Hi-ROM Enable” command sequence
Factory serialized and protected to provide a secure electronic serial number (ESN)
- **$\overline{WP}/ACC$ input pin**
At V_{IL} , allows protection of boot sectors, regardless of sector protection/unprotection status
(MB84VD2218XA:SA69,SA70 MB84VD2219XA:SA0,SA1)
At V_{IH} , allows removal of boot sector protection
At V_{ACC} , program time will reduce by 40%.
- **Erase Suspend/Resume**
Suspends the erase operation to allow a read in another sector within the same device
- **Please refer to “MBM29DL32XT/B” data sheet in detailed function**

2. SRAM

- **Power dissipation**
Operating: 40 mA max.
Standby: 7 μ A max.
- **Power down features using $\overline{CE1s}$ and $CE2s$**
- **Data retention supply voltage: 1.5 V to 3.6 V**
- **$\overline{CE1s}$ and $CE2s$ Chip Select**
- **Byte data control: $\overline{LBs}(DQ_0-DQ_7)$, $\overline{UBs}(DQ_8-DQ_{15})$**

■ PACKAGE

77-ball plastic BGA



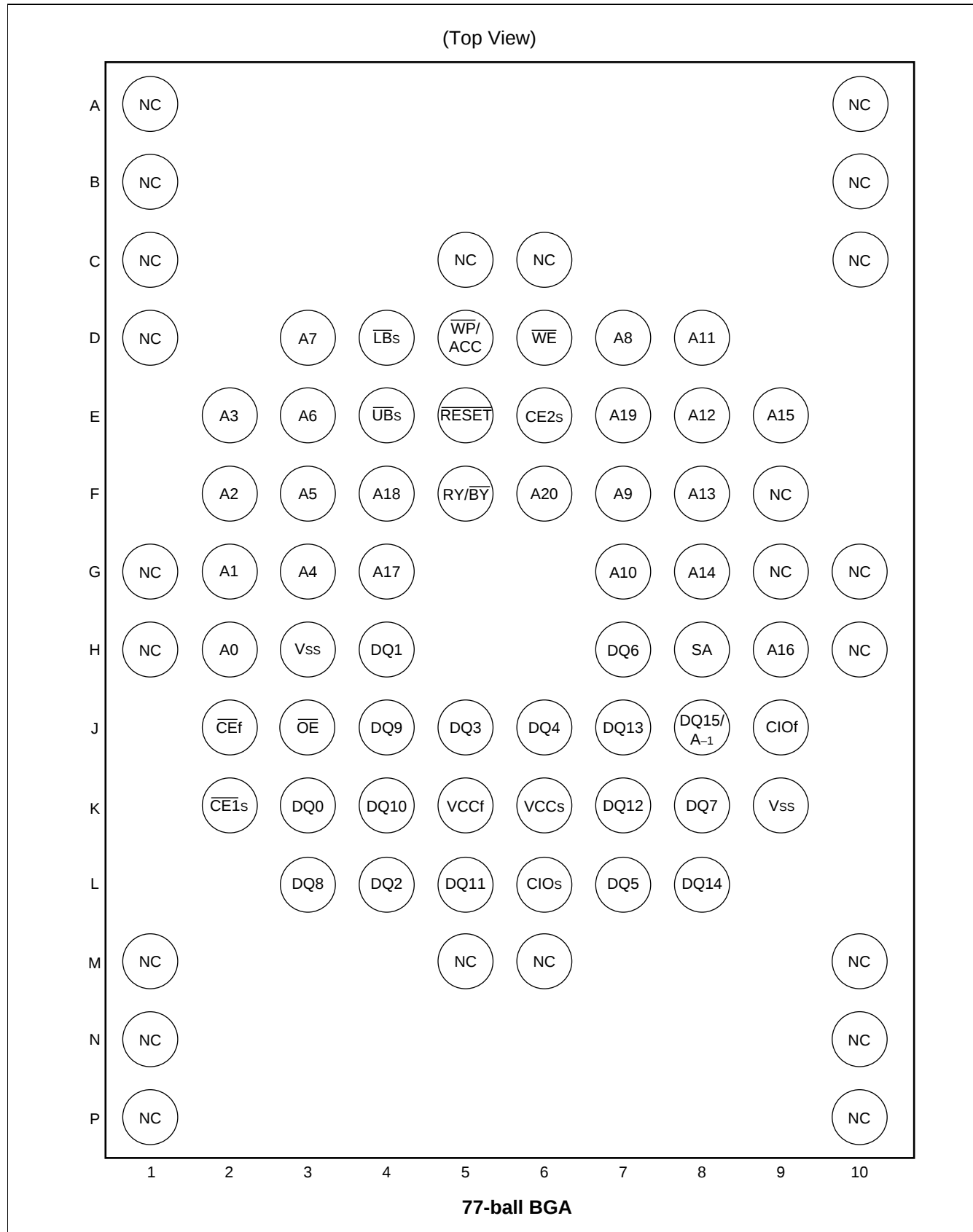
(BGA-77P-M01)

■ PRODUCT LINE UP

		Flash Memory	SRAM
Ordering Part No.	$V_{CC} = 3.0\text{ V} \begin{smallmatrix} +0.6\text{ V} \\ -0.3\text{ V} \end{smallmatrix}$	MB84VD2218X/XA-10/MB84VD2219X/XA-10	
Max. Address Access Time (ns)		100	85
Max. $\overline{CE}$ Access Time (ns)		100	85
Max. $\overline{OE}$ Access Time (ns)		40	45

MB84VD2218X/2218XA/2219X/2219XA-10

PIN ASSIGNMENT



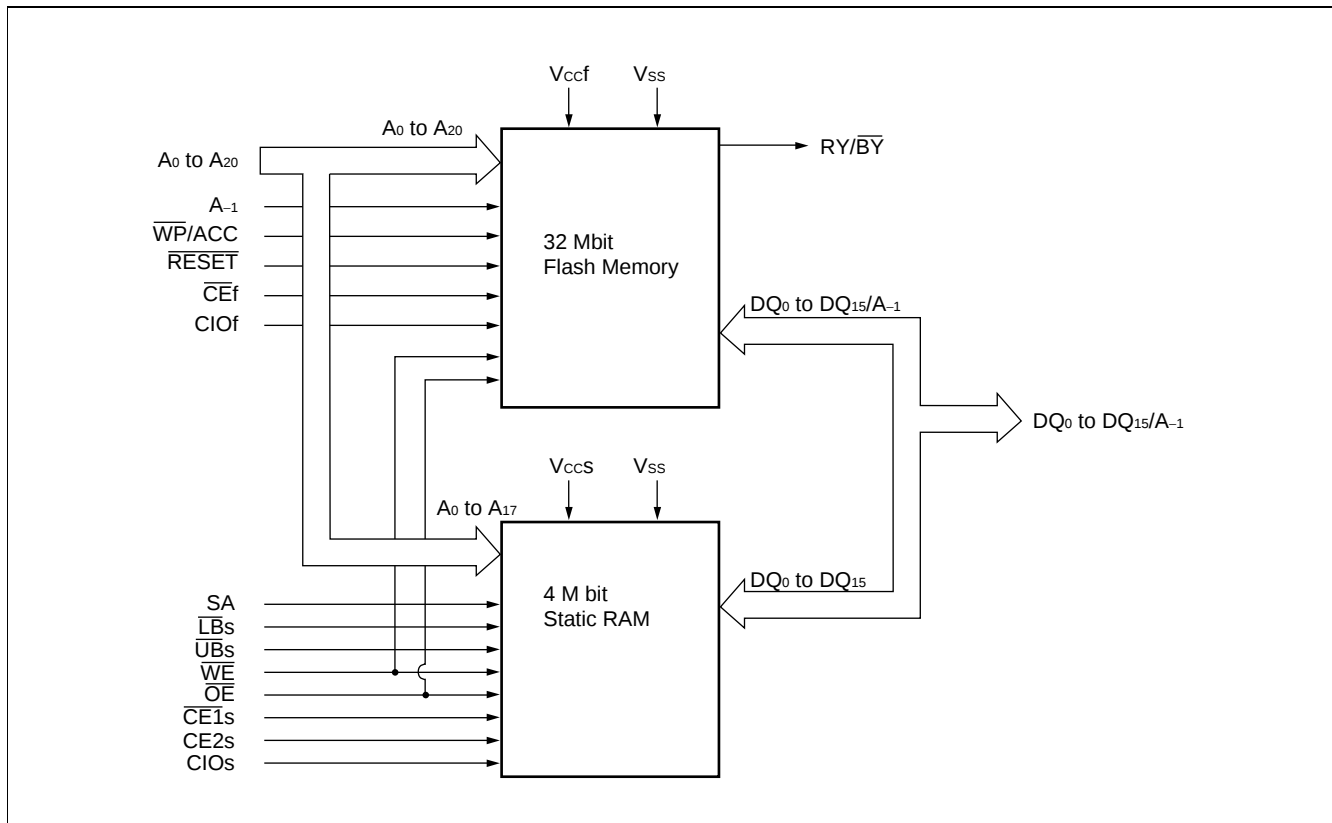
MB84VD2218X/2218XA/2219X/2219XA-10

■ PIN DESCRIPTION

Pin Name	Function	Input/Output
A ₀ to A ₁₇	Address Inputs (Common)	I
A ₋₁ , A ₁₈ to A ₂₀	Address Input (Flash)	I
SA	Address Input (SRAM)	I
DQ ₀ to DQ ₁₅	Data Inputs/Outputs (Common)	I/O
$\overline{\text{CE}}\text{f}$	Chip Enable (Flash)	I
$\overline{\text{CE}}\text{1s}$	Chip Enable (SRAM)	I
CE2s	Chip Enable (SRAM)	I
$\overline{\text{OE}}$	Output Enable (Common)	I
$\overline{\text{WE}}$	Write Enable (Common)	I
RY/ $\overline{\text{BY}}$	Ready/Busy Outputs (Flash) Open Drain Output	O
$\overline{\text{UB}}\text{s}$	Upper Byte Control (SRAM)	I
$\overline{\text{LB}}\text{s}$	Lower Byte Control (SRAM)	I
CIO _f	I/O Configuration (Flash) CIO _f = V _{IH} is Word mode (×16), CIO _f = V _{IL} is Byte mode (×8)	I
CIO _s	I/O Configuration (SRAM) CIO _s = V _{IH} is Word mode (×16), CIO _s = V _{IL} is Byte mode (×8)	I
$\overline{\text{RESET}}$	Hardware Reset Pin/Sector Protection Unlock (Flash)	I
$\overline{\text{WP}}/\text{ACC}$	Write Protect / Accelaration (Flash)	I
N.C.	No Internal Connection	—
V _{SS}	Device Ground (Common)	Power
V _{CCf}	Device Power Supply (Flash)	Power
V _{CCS}	Device Power Supply (SRAM)	Power

MB84VD2218X/2218XA/2219X/2219XA-10

■ BLOCK DIAGRAM



MB84VD2218X/2218XA/2219X/2219XA-10

■ DEVICE BUS OPERATIONS

Table 1.1 User Bus Operations (Flash=Word mode; CIOF=V_{IH}, SRAM=Word mode; CIOs=V_{IH})

Operation (1), (3)	$\overline{CEf}$	$\overline{CE1s}$	CE2s	$\overline{OE}$	$\overline{WE}$	SA (6)	$\overline{LBs}$	$\overline{UBs}$	DQ ₀ to DQ ₇	DQ ₈ to DQ ₁₅	$\overline{RESET}$	$\overline{WP/ACC}$ (5)
Full Standby	H	H	X	X	X	X	X	X	HIGH-Z	HIGH-Z	H	X
		X	L									
Output Disable	H	L	H	H	H	X	X	X	HIGH-Z	HIGH-Z	H	X
				X	X	X	H	H	HIGH-Z	HIGH-Z		
	L	H	X	H	H	X	X	X	HIGH-Z	HIGH-Z		
Read from Flash (2)	L	H	X	L	H	X	X	X	D _{OUT}	D _{OUT}	H	X
		X	L									
Write to Flash	L	H	X	H	L	X	X	X	D _{IN}	D _{IN}	H	X
		X	L									
Read from SRAM	H	L	H	L	H	X	L	L	D _{OUT}	D _{OUT}	H	X
							H	L	HIGH-Z	D _{OUT}		
							L	H	D _{OUT}	HIGH-Z		
Write to SRAM	H	L	H	X	L	X	L	L	D _{IN}	D _{IN}	H	X
							H	L	HIGH-Z	D _{IN}		
							L	H	D _{IN}	HIGH-Z		
Temporary Sector Group Unprotection(4)	X	X	X	X	X	X	X	X	X	X	V _{ID}	X
Flash Hardware Reset	X	H	X	X	X	X	X	X	HIGH-Z	HIGH-Z	L	X
		X	L									
Boot Block Sector Write Protection	X	X	X	X	X	X	X	X	X	X	X	L

Legend: L = V_{IL}, H = V_{IH}, X = V_{IL} or V_{IH}. See DC Characteristics for voltage levels.

Notes: 1. Other operations except for indicated this column are inhibited.

2. $\overline{WE}$ can be V_{IL} if $\overline{OE}$ is V_{IL}, $\overline{OE}$ at V_{IH} initiates the write operations.

3. Do not apply $\overline{CEf} = V_{IL}$, $\overline{CE1s} = V_{IL}$ and $CE2s = V_{IH}$ at a time.

4. It is also used for the extended sector group protections.

5. $\overline{WP/ACC} = V_{IL}$; protection of boot sectors.

$\overline{WP/ACC} = V_{IH}$; removal of boot sectors protection.

$\overline{WP/ACC} = V_{ACC}$ (9V) ; Program time will reduce by 40%.

6. SA ; Don't care or Open.

MB84VD2218X/2218XA/2219X/2219XA-10

Table 1.2 User Bus Operations (Flash=Word mode; CIOF=V_{IH}, SRAM=Byte mode; CIOs=V_{IL})

Operation (1), (3)	$\overline{CEf}$	$\overline{CE1s}$	CE2s	$\overline{OE}$	$\overline{WE}$	SA	$\overline{LBs}$ (6)	$\overline{UBs}$ (6)	DQ ₀ to DQ ₇	DQ ₈ to DQ ₁₅	$\overline{RESET}$	$\overline{WP/ACC}$ (5)
Full Standby	H	H	X	X	X	X	X	X	HIGH-Z	HIGH-Z	H	X
		X	L									
Output Disable	H	L	H	H	H	X	X	X	HIGH-Z	HIGH-Z	H	X
				X	X	X	X	X	HIGH-Z	HIGH-Z		
	L	H	X	H	H	X	X	X	HIGH-Z	HIGH-Z		
Read from Flash (2)	L	H	X	L	H	X	X	X	D _{OUT}	D _{OUT}	H	X
		X	L									
Write to Flash	L	H	X	H	L	X	X	X	D _{IN}	D _{IN}	H	X
		X	L									
Read from SRAM	H	L	H	L	H	SA	X	X	D _{OUT}	HIGH-Z	H	X
Write to SRAM	H	L	H	X	L	SA	X	X	D _{IN}	HIGH-Z	H	X
Temporary Sector Group Unprotection(4)	X	X	X	X	X	X	X	X	X	X	V _{ID}	X
Flash Hardware Reset	X	H	X	X	X	X	X	X	HIGH-Z	HIGH-Z	L	X
		X	L									
Boot Block Sector Write Protection	X	X	X	X	X	X	X	X	X	X	X	L

Legend: L = V_{IL}, H = V_{IH}, X = V_{IL} or V_{IH}. See DC Characteristics for voltage levels.

- Notes: 1. Other operations except for indicated this column are inhibited.
 2. $\overline{WE}$ can be V_{IL} if $\overline{OE}$ is V_{IL}, $\overline{OE}$ at V_{IH} initiates the write operations.
 3. Do not apply $\overline{CEf}$ = V_{IL}, $\overline{CE1s}$ = V_{IL} and CE2s = V_{IH} at a time.
 4. It is also used for the extended sector group protections.
 5. $\overline{WP/ACC}$ = V_{IL} ; protection of boot sectors.
 $\overline{WP/ACC}$ = V_{IH} ; removal of boot sectors protection.
 $\overline{WP/ACC}$ = V_{ACC} (9V) ; Program time will reduce by 40%.
 6. $\overline{LBs}$, $\overline{UBs}$; Don't care or Open.

MB84VD2218X/2218XA/2219X/2219XA-10

Table 1.3 User Bus Operations (Flash=Byte mode; CIOF=V_{IL}, SRAM=Byte mode; CIOs=V_{IL})

Operation (1), (3)	$\overline{CEf}$	$\overline{CE1s}$	CE2s	DQ _{15/A-1}	$\overline{OE}$	$\overline{WE}$	SA	$\overline{LBs}$ (6)	$\overline{UBs}$ (6)	DQ ₀ to DQ ₇	DQ ₈ to DQ ₁₄	$\overline{RESET}$	$\overline{WP/ACC}$ (5)
Full Standby	H	H	X	X	X	X	X	X	X	HIGH-Z	HIGH-Z	H	X
		X	L										
Output Disable	H	L	H	X	H	H	X	X	X	HIGH-Z	HIGH-Z	H	X
				X	X	X	X	X	X	HIGH-Z	HIGH-Z		
	L	H	X	A ₋₁	H	H	X	X	X	HIGH-Z	HIGH-Z		
Read from Flash (2)	L	H	X	A ₋₁	L	H	X	X	X	D _{OUT}	X	H	X
		X	L										
Write to Flash	L	H	X	A ₋₁	H	L	X	X	X	D _{IN}	X	H	X
		X	L										
Read from SRAM	H	L	H	X	L	H	SA	X	X	D _{OUT}	HIGH-Z	H	X
Write to SRAM	H	L	H	X	X	L	SA	X	X	D _{IN}	HIGH-Z	H	X
Temporary Sector Group Unprotection(4)	X	X	X	X	X	X	X	X	X	X	X	V _{ID}	X
Flash Hardware Reset	X	H	X	X	X	X	X	X	X	HIGH-Z	HIGH-Z	L	X
		X	L										
Boot Block Sector Write Protection	X	X	X	X	X	X	X	X	X	X	X	X	L

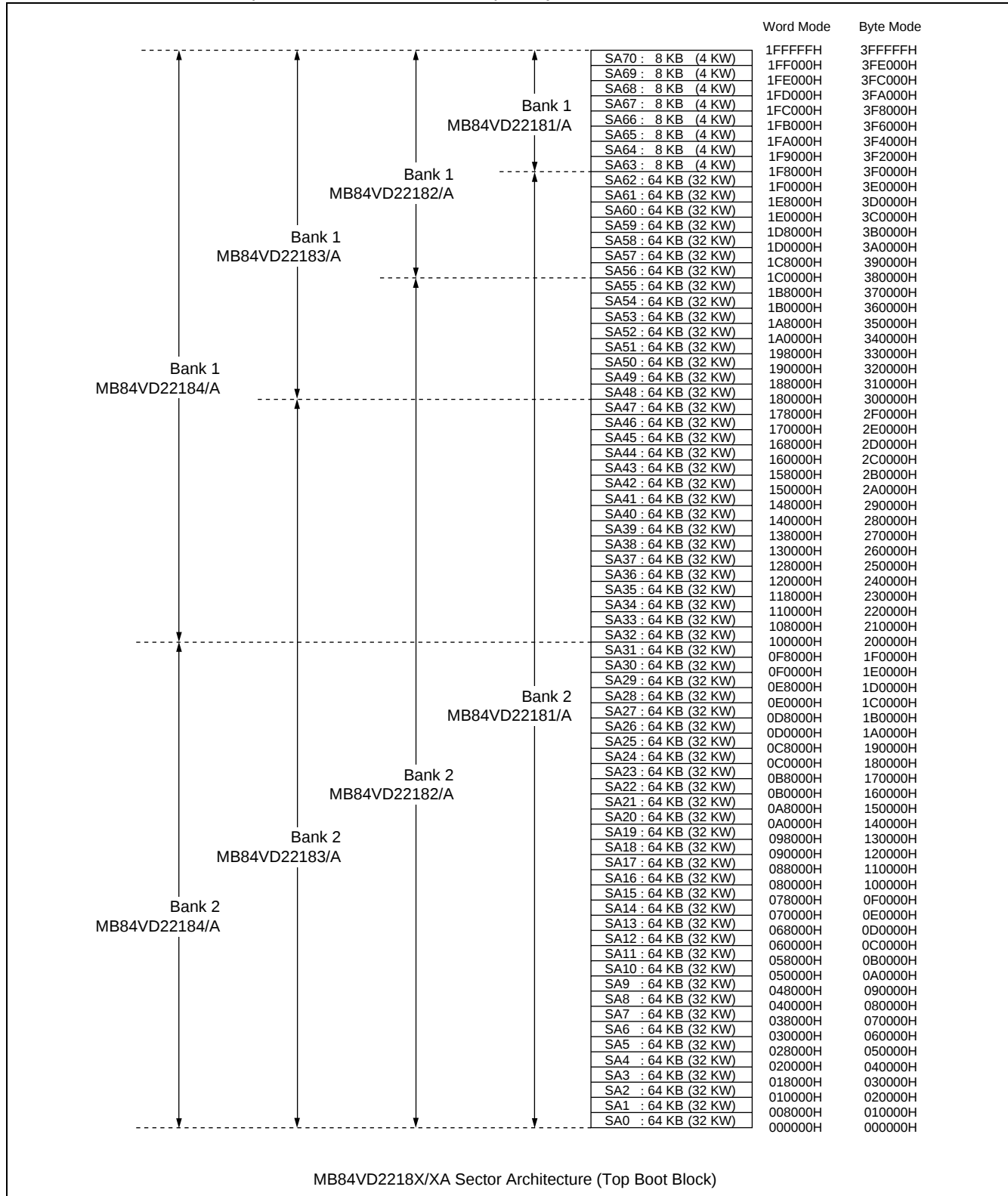
Legend: L = V_{IL}, H = V_{IH}, X = V_{IL} or V_{IH}. See DC Characteristics for voltage levels.

- Notes: 1. Other operations except for indicated this column are inhibited.
 2. $\overline{WE}$ can be V_{IL} if $\overline{OE}$ is V_{IL}, $\overline{OE}$ at V_{IH} initiates the write operations.
 3. Do not apply $\overline{CEf}$ = V_{IL}, $\overline{CE1s}$ = V_{IL} and CE2s = V_{IH} at a time.
 4. It is also used for the extended sector group protections.
 5. $\overline{WP/ACC}$ = V_{IL} ; protection of boot sectors.
 $\overline{WP/ACC}$ = V_{IH} ; removal of boot sectors protection.
 $\overline{WP/ACC}$ = V_{ACC} (9V) ; Program time will reduce by 40%.
 6. $\overline{LBs}$, $\overline{UBs}$; Don't care or Open.

MB84VD2218X/2218XA/2219X/2219XA-10

■ FLEXIBLE SECTOR-ERASE ARCHITECTURE on FLASH MEMORY

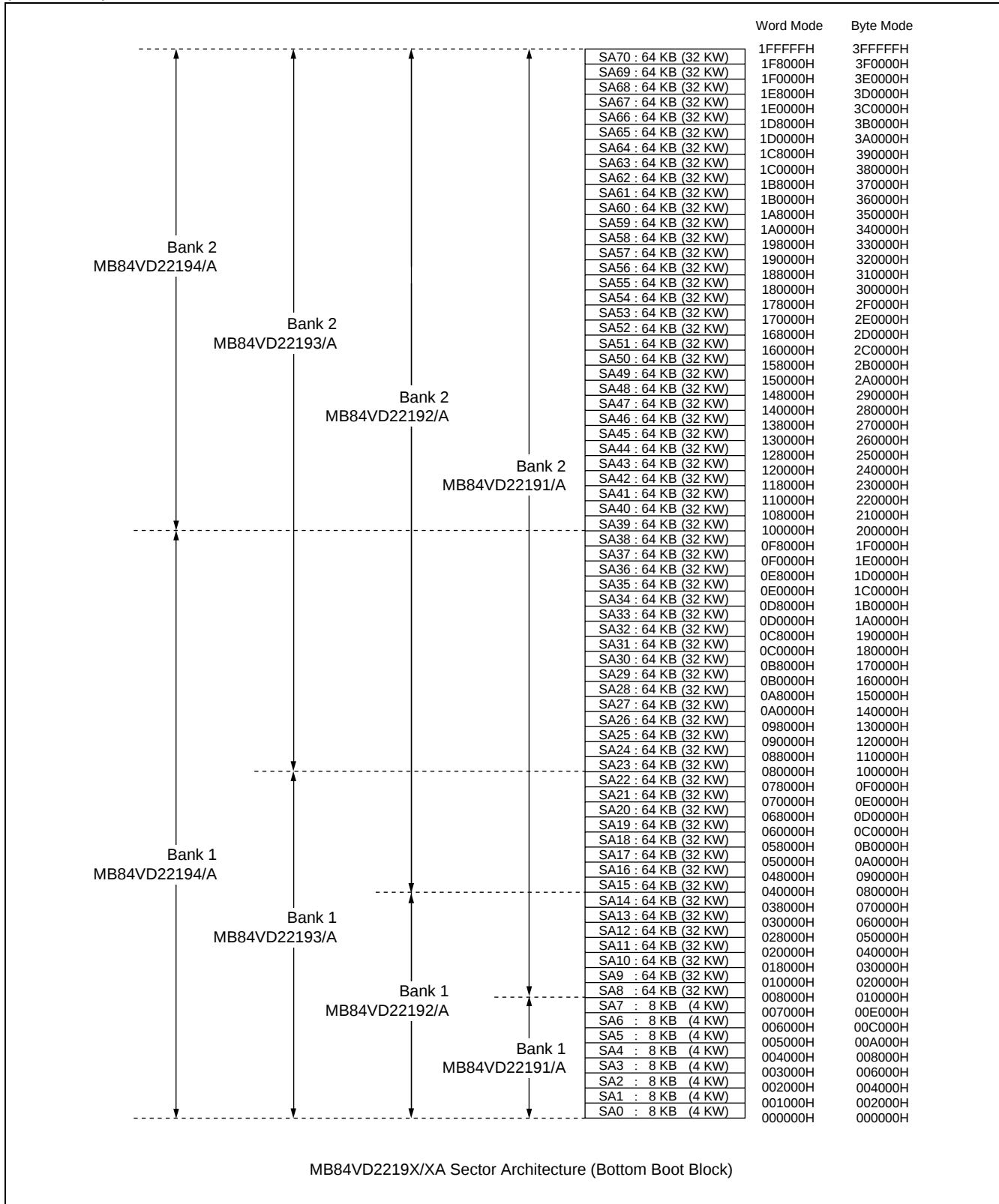
- Eight 4 K words, and sixty three 32 K words.
- Individual-sector, multiple-sector, or bulk-erase capability.



(Continued)

MB84VD2218X/2218XA/2219X/2219XA-10

(Continued)



MB84VD2218X/2218XA/2219X/2219XA-10

Table 2.1 Sector Address Tables (MB84VD22181/A)

Bank	Sector	Sector Address										Address Range (BYTE mode)	Address Range (WORD mode)
		Bank Address											
		A ₂₀	A ₁₉	A ₁₈	A ₁₇	A ₁₆	A ₁₅	A ₁₄	A ₁₃	A ₁₂	A ₁₁		
Bank 2	SA0	0	0	0	0	0	0	X	X	X	X	000000H to 00FFFFH	000000H to 007FFFH
	SA1	0	0	0	0	0	1	X	X	X	X	010000H to 01FFFFH	008000H to 00FFFFH
	SA2	0	0	0	0	1	0	X	X	X	X	020000H to 02FFFFH	010000H to 017FFFH
	SA3	0	0	0	0	1	1	X	X	X	X	030000H to 03FFFFH	018000H to 01FFFFH
	SA4	0	0	0	1	0	0	X	X	X	X	040000H to 04FFFFH	020000H to 027FFFH
	SA5	0	0	0	1	0	1	X	X	X	X	050000H to 05FFFFH	028000H to 02FFFFH
	SA6	0	0	0	1	1	0	X	X	X	X	060000H to 06FFFFH	030000H to 037FFFH
	SA7	0	0	0	1	1	1	X	X	X	X	070000H to 07FFFFH	038000H to 03FFFFH
	SA8	0	0	1	0	0	0	X	X	X	X	080000H to 08FFFFH	040000H to 047FFFH
	SA9	0	0	1	0	0	1	X	X	X	X	090000H to 09FFFFH	048000H to 04FFFFH
	SA10	0	0	1	0	1	0	X	X	X	X	0A0000H to 0AFFFFH	050000H to 057FFFH
	SA11	0	0	1	0	1	1	X	X	X	X	0B0000H to 0BFFFFH	058000H to 05FFFFH
	SA12	0	0	1	1	0	0	X	X	X	X	0C0000H to 0CFFFFH	060000H to 067FFFH
	SA13	0	0	1	1	0	1	X	X	X	X	0D0000H to 0DFFFFH	068000H to 06FFFFH
	SA14	0	0	1	1	1	0	X	X	X	X	0E0000H to 0EFFFFH	070000H to 077FFFH
	SA15	0	0	1	1	1	1	X	X	X	X	0F0000H to 0FFFFFH	078000H to 07FFFFH
	SA16	0	1	0	0	0	0	X	X	X	X	100000H to 10FFFFH	080000H to 087FFFH
	SA17	0	1	0	0	0	1	X	X	X	X	110000H to 11FFFFH	088000H to 08FFFFH
	SA18	0	1	0	0	1	0	X	X	X	X	120000H to 12FFFFH	090000H to 097FFFH
	SA19	0	1	0	0	1	1	X	X	X	X	130000H to 13FFFFH	098000H to 09FFFFH
	SA20	0	1	0	1	0	0	X	X	X	X	140000H to 14FFFFH	0A0000H to 0A7FFFH
	SA21	0	1	0	1	0	1	X	X	X	X	150000H to 15FFFFH	0A8000H to 0AFFFFH
	SA22	0	1	0	1	1	0	X	X	X	X	160000H to 16FFFFH	0B0000H to 0B7FFFH
	SA23	0	1	0	1	1	1	X	X	X	X	170000H to 17FFFFH	0B8000H to 0BFFFFH
	SA24	0	1	1	0	0	0	X	X	X	X	180000H to 18FFFFH	0C0000H to 0C7FFFH
	SA25	0	1	1	0	0	1	X	X	X	X	190000H to 19FFFFH	0C8000H to 0CFFFFH
	SA26	0	1	1	0	1	0	X	X	X	X	1A0000H to 1AFFFFH	0D0000H to 0D7FFFH
	SA27	0	1	1	0	1	1	X	X	X	X	1B0000H to 1BFFFFH	0D8000H to 0DFFFFH
	SA28	0	1	1	1	0	0	X	X	X	X	1C0000H to 1CFFFFH	0E0000H to 0E7FFFH
	SA29	0	1	1	1	0	1	X	X	X	X	1D0000H to 1DFFFFH	0E8000H to 0EFFFFH
	SA30	0	1	1	1	1	0	X	X	X	X	1E0000H to 1EFFFFH	0F0000H to 0F7FFFH
	SA31	0	1	1	1	1	1	X	X	X	X	1F0000H to 1FFFFFH	0F8000H to 0FFFFFH

(Continued)

MB84VD2218X/2218XA/2219X/2219XA-10

(Continued)

Bank	Sector	Sector Address										Address Range (BYTE mode)	Address Range (WORD mode)
		Bank Address											
		A20	A19	A18	A17	A16	A15	A14	A13	A12	A11		
Bank 2	SA32	1	0	0	0	0	0	X	X	X	X	200000H to 20FFFFH	100000H to 107FFFFH
	SA33	1	0	0	0	0	1	X	X	X	X	210000H to 21FFFFH	108000H to 10FFFFH
	SA34	1	0	0	0	1	0	X	X	X	X	220000H to 22FFFFH	110000H to 117FFFFH
	SA35	1	0	0	0	1	1	X	X	X	X	230000H to 23FFFFH	118000H to 11FFFFH
	SA36	1	0	0	1	0	0	X	X	X	X	240000H to 24FFFFH	120000H to 127FFFFH
	SA37	1	0	0	1	0	1	X	X	X	X	250000H to 25FFFFH	128000H to 12FFFFH
	SA38	1	0	0	1	1	0	X	X	X	X	260000H to 26FFFFH	130000H to 137FFFFH
	SA39	1	0	0	1	1	1	X	X	X	X	270000H to 27FFFFH	138000H to 13FFFFH
	SA40	1	0	1	0	0	0	X	X	X	X	280000H to 28FFFFH	140000H to 147FFFFH
	SA41	1	0	1	0	0	1	X	X	X	X	290000H to 29FFFFH	148000H to 14FFFFH
	SA42	1	0	1	0	1	0	X	X	X	X	2A0000H to 2AFFFFH	150000H to 157FFFFH
	SA43	1	0	1	0	1	1	X	X	X	X	2B0000H to 2BFFFFH	158000H to 15FFFFH
	SA44	1	0	1	1	0	0	X	X	X	X	2C0000H to 2CFFFFH	160000H to 167FFFFH
	SA45	1	0	1	1	0	1	X	X	X	X	2D0000H to 2DFFFFH	168000H to 16FFFFH
	SA46	1	0	1	1	1	0	X	X	X	X	2E0000H to 2EFFFFH	170000H to 177FFFFH
	SA47	1	0	1	1	1	1	X	X	X	X	2F0000H to 2FFFFFH	178000H to 17FFFFH
	SA48	1	1	0	0	0	0	X	X	X	X	300000H to 30FFFFH	180000H to 187FFFFH
	SA49	1	1	0	0	0	1	X	X	X	X	310000H to 31FFFFH	188000H to 18FFFFH
	SA50	1	1	0	0	1	0	X	X	X	X	320000H to 32FFFFH	190000H to 197FFFFH
	SA51	1	1	0	0	1	1	X	X	X	X	330000H to 33FFFFH	198000H to 19FFFFH
	SA52	1	1	0	1	0	0	X	X	X	X	340000H to 34FFFFH	1A0000H to 1A7FFFFH
	SA53	1	1	0	1	0	1	X	X	X	X	350000H to 35FFFFH	1A8000H to 1AFFFFH
	SA54	1	1	0	1	1	0	X	X	X	X	360000H to 36FFFFH	1B0000H to 1B7FFFFH
	SA55	1	1	0	1	1	1	X	X	X	X	370000H to 37FFFFH	1B8000H to 1BFFFFH
	SA56	1	1	1	0	0	0	X	X	X	X	380000H to 38FFFFH	1C0000H to 1C7FFFFH
	SA57	1	1	1	0	0	1	X	X	X	X	390000H to 39FFFFH	1C8000H to 1CFFFFH
	SA58	1	1	1	0	1	0	X	X	X	X	3A0000H to 3AFFFFH	1D0000H to 1D7FFFFH
	SA59	1	1	1	0	1	1	X	X	X	X	3B0000H to 3BFFFFH	1D8000H to 1DFFFFH
	SA60	1	1	1	1	0	0	X	X	X	X	3C0000H to 3CFFFFH	1E0000H to 1E7FFFFH
	SA61	1	1	1	1	0	1	X	X	X	X	3D0000H to 3DFFFFH	1E8000H to 1EFFFFH
	SA62	1	1	1	1	1	0	X	X	X	X	3E0000H to 3EFFFFH	1F0000H to 1F7FFFFH
Bank 1	SA63	1	1	1	1	1	1	0	0	0	X	3F0000H to 3F1FFFFH	1F8000H to 1F8FFFFH
	SA64	1	1	1	1	1	1	0	0	1	X	3F2000H to 3F3FFFFH	1F9000H to 1F9FFFFH
	SA65	1	1	1	1	1	1	0	1	0	X	3F4000H to 3F5FFFFH	1FA000H to 1FAFFFFH
	SA66	1	1	1	1	1	1	0	1	1	X	3F6000H to 3F7FFFFH	1FB000H to 1FBFFFFH
	SA67	1	1	1	1	1	1	1	0	0	X	3F8000H to 3F9FFFFH	1FC000H to 1FCFFFFH
	SA68	1	1	1	1	1	1	1	0	1	X	3FA000H to 3FAFFFFH	1FD000H to 1FDFFFFH
	SA69	1	1	1	1	1	1	1	1	0	X	3FC000H to 3FCFFFFH	1FE000H to 1FEFFFFH
	SA70	1	1	1	1	1	1	1	1	1	X	3FE000H to 3FFFFFH	1FF000H to 1FFFFFH

MB84VD2218X/2218XA/2219X/2219XA-10

Table 2.2 Sector Address Tables (MB84VD22191/A)

Bank	Sector	Sector Address										Address Range (BYTE mode)	Address Range (WORD mode)
		Band Address											
		A ₂₀	A ₁₉	A ₁₈	A ₁₇	A ₁₆	A ₁₅	A ₁₄	A ₁₃	A ₁₂	A ₁₁		
Bank 1	SA0	0	0	0	0	0	0	0	0	0	X	000000H to 001FFFFH	000000H to 000FFFFH
	SA1	0	0	0	0	0	0	0	0	1	X	002000H to 003FFFFH	001000H to 001FFFFH
	SA2	0	0	0	0	0	0	0	1	0	X	004000H to 005FFFFH	002000H to 002FFFFH
	SA3	0	0	0	0	0	0	0	1	1	X	006000H to 007FFFFH	003000H to 003FFFFH
	SA4	0	0	0	0	0	0	1	0	0	X	008000H to 009FFFFH	004000H to 004FFFFH
	SA5	0	0	0	0	0	0	1	0	1	X	00A000H to 00BFFFFH	005000H to 005FFFFH
	SA6	0	0	0	0	0	0	1	1	0	X	00C000H to 00DFFFFH	006000H to 006FFFFH
	SA7	0	0	0	0	0	0	1	1	1	X	00E000H to 00FFFFFFH	007000H to 007FFFFH
Bank 2	SA8	0	0	0	0	0	1	X	X	X	X	010000H to 01FFFFFFH	008000H to 00FFFFFFH
	SA9	0	0	0	0	1	0	X	X	X	X	020000H to 02FFFFFFH	010000H to 017FFFFH
	SA10	0	0	0	0	1	1	X	X	X	X	030000H to 03FFFFFFH	018000H to 01FFFFFFH
	SA11	0	0	0	1	0	0	X	X	X	X	040000H to 04FFFFFFH	020000H to 027FFFFH
	SA12	0	0	0	1	0	1	X	X	X	X	050000H to 05FFFFFFH	028000H to 02FFFFFFH
	SA13	0	0	0	1	1	0	X	X	X	X	060000H to 06FFFFFFH	030000H to 037FFFFH
	SA14	0	0	0	1	1	1	X	X	X	X	070000H to 07FFFFFFH	038000H to 03FFFFFFH
	SA15	0	0	1	0	0	0	X	X	X	X	080000H to 08FFFFFFH	040000H to 047FFFFH
	SA16	0	0	1	0	0	1	X	X	X	X	090000H to 09FFFFFFH	048000H to 04FFFFFFH
	SA17	0	0	1	0	1	0	X	X	X	X	0A0000H to 0AFFFFFFH	050000H to 057FFFFH
	SA18	0	0	1	0	1	1	X	X	X	X	0B0000H to 0BFFFFFFH	058000H to 05FFFFFFH
	SA19	0	0	1	1	0	0	X	X	X	X	0C0000H to 0CFFFFFFH	060000H to 067FFFFH
	SA20	0	0	1	1	0	1	X	X	X	X	0D0000H to 0DFFFFFFH	068000H to 06FFFFFFH
	SA21	0	0	1	1	1	0	X	X	X	X	0E0000H to 0EFFFFFFH	070000H to 077FFFFH
	SA22	0	0	1	1	1	1	X	X	X	X	0F0000H to 0FFFFFFH	078000H to 07FFFFFFH
	SA23	0	1	0	0	0	0	X	X	X	X	100000H to 10FFFFFFH	080000H to 087FFFFH
	SA24	0	1	0	0	0	1	X	X	X	X	110000H to 11FFFFFFH	088000H to 08FFFFFFH
	SA25	0	1	0	0	1	0	X	X	X	X	120000H to 12FFFFFFH	090000H to 097FFFFH
	SA26	0	1	0	0	1	1	X	X	X	X	130000H to 13FFFFFFH	098000H to 09FFFFFFH
	SA27	0	1	0	1	0	0	X	X	X	X	140000H to 14FFFFFFH	0A0000H to 0A7FFFFH
	SA28	0	1	0	1	0	1	X	X	X	X	150000H to 15FFFFFFH	0A8000H to 0AFFFFFFH
	SA29	0	1	0	1	1	0	X	X	X	X	160000H to 16FFFFFFH	0B0000H to 0B7FFFFH
	SA30	0	1	0	1	1	1	X	X	X	X	170000H to 17FFFFFFH	0B8000H to 0BFFFFFFH
	SA31	0	1	1	0	0	0	X	X	X	X	180000H to 18FFFFFFH	0C0000H to 0C7FFFFH
	SA32	0	1	1	0	0	1	X	X	X	X	190000H to 19FFFFFFH	0C8000H to 0CFFFFFFH
	SA33	0	1	1	0	1	0	X	X	X	X	1A0000H to 1AFFFFFFH	0D0000H to 0D7FFFFH
	SA34	0	1	1	0	1	1	X	X	X	X	1B0000H to 1BFFFFFFH	0D8000H to 0DFFFFFFH
	SA35	0	1	1	1	0	0	X	X	X	X	1C0000H to 1CFFFFFFH	0E0000H to 0E7FFFFH
SA36	0	1	1	1	0	1	X	X	X	X	1D0000H to 1DFFFFFFH	0E8000H to 0EFFFFFFH	

(Continued)

MB84VD2218X/2218XA/2219X/2219XA-10

(Continued)

Bank	Sector	Sector Address										Address Range (BYTE mode)	Address Range (WORD mode)
		Bank Address											
		A ₂₀	A ₁₉	A ₁₈	A ₁₇	A ₁₆	A ₁₅	A ₁₄	A ₁₃	A ₁₂	A ₁₁		
Bank 2	SA37	0	1	1	1	1	0	X	X	X	X	1E0000H to 1EFFFFH	0F0000H to 0F7FFFFH
	SA38	0	1	1	1	1	1	X	X	X	X	1F0000H to 1FFFFFH	0F8000H to 0FFFFFH
	SA39	1	0	0	0	0	0	X	X	X	X	200000H to 20FFFFH	100000H to 107FFFFH
	SA40	1	0	0	0	0	1	X	X	X	X	210000H to 21FFFFH	108000H to 10FFFFH
	SA41	1	0	0	0	1	0	X	X	X	X	220000H to 22FFFFH	110000H to 117FFFFH
	SA42	1	0	0	0	1	1	X	X	X	X	230000H to 23FFFFH	118000H to 11FFFFH
	SA43	1	0	0	1	0	0	X	X	X	X	240000H to 24FFFFH	120000H to 127FFFFH
	SA44	1	0	0	1	0	1	X	X	X	X	250000H to 25FFFFH	128000H to 12FFFFH
	SA45	1	0	0	1	1	0	X	X	X	X	260000H to 26FFFFH	130000H to 137FFFFH
	SA46	1	0	0	1	1	1	X	X	X	X	270000H to 27FFFFH	138000H to 13FFFFH
	SA47	1	0	1	0	0	0	X	X	X	X	280000H to 28FFFFH	140000H to 147FFFFH
	SA48	1	0	1	0	0	1	X	X	X	X	290000H to 29FFFFH	148000H to 14FFFFH
	SA49	1	0	1	0	1	0	X	X	X	X	2A0000H to 2AFFFFH	150000H to 157FFFFH
	SA50	1	0	1	0	1	1	X	X	X	X	2B0000H to 2BFFFFH	158000H to 15FFFFH
	SA51	1	0	1	1	0	0	X	X	X	X	2C0000H to 2CFFFFH	160000H to 167FFFFH
	SA52	1	0	1	1	0	1	X	X	X	X	2D0000H to 2DFFFFH	168000H to 16FFFFH
	SA53	1	0	1	1	1	0	X	X	X	X	2E0000H to 2EFFFFH	170000H to 177FFFFH
	SA54	1	0	1	1	1	1	X	X	X	X	2F0000H to 2FFFFFH	178000H to 17FFFFH
	SA55	1	1	0	0	0	0	X	X	X	X	300000H to 30FFFFH	180000H to 187FFFFH
	SA56	1	1	0	0	0	1	X	X	X	X	310000H to 31FFFFH	188000H to 18FFFFH
	SA57	1	1	0	0	1	0	X	X	X	X	320000H to 32FFFFH	190000H to 197FFFFH
	SA58	1	1	0	0	1	1	X	X	X	X	330000H to 33FFFFH	198000H to 19FFFFH
	SA59	1	1	0	1	0	0	X	X	X	X	340000H to 34FFFFH	1A0000H to 1A7FFFFH
	SA60	1	1	0	1	0	1	X	X	X	X	350000H to 35FFFFH	1A8000H to 1AFFFFH
	SA61	1	1	0	1	1	0	X	X	X	X	360000H to 36FFFFH	1B0000H to 1B7FFFFH
	SA62	1	1	0	1	1	1	X	X	X	X	370000H to 37FFFFH	1B8000H to 1BFFFFH
	SA63	1	1	1	0	0	0	X	X	X	X	380000H to 38FFFFH	1C0000H to 1C7FFFFH
	SA64	1	1	1	0	0	1	X	X	X	X	390000H to 39FFFFH	1C8000H to 1CFFFFH
	SA65	1	1	1	0	1	0	X	X	X	X	3A0000H to 3AFFFFH	1D0000H to 1D7FFFFH
	SA66	1	1	1	0	1	1	X	X	X	X	3B0000H to 3BFFFFH	1D8000H to 1DFFFFH
	SA67	1	1	1	1	0	0	X	X	X	X	3C0000H to 3CFFFFH	1E0000H to 1E7FFFFH
	SA68	1	1	1	1	0	1	X	X	X	X	3D0000H to 3DFFFFH	1E8000H to 1EFFFFH
	SA69	1	1	1	1	1	0	X	X	X	X	3E0000H to 3EFFFFH	1F0000H to 1F7FFFFH
	SA70	1	1	1	1	1	1	X	X	X	X	3F0000H to 3FFFFFH	1F8000H to 1FFFFFH

MB84VD2218X/2218XA/2219X/2219XA-10

Table 2.3 Sector Address Tables (MB84VD22182/A)

Bank	Sector	Sector Address										Address Range (BYTE mode)	Address Range (WORD mode)
		Bank Address											
		A ₂₀	A ₁₉	A ₁₈	A ₁₇	A ₁₆	A ₁₅	A ₁₄	A ₁₃	A ₁₂	A ₁₁		
Bank 2	SA0	0	0	0	0	0	0	X	X	X	X	000000H to 00FFFFH	000000H to 007FFFH
	SA1	0	0	0	0	0	1	X	X	X	X	010000H to 01FFFFH	008000H to 00FFFFH
	SA2	0	0	0	0	1	0	X	X	X	X	020000H to 02FFFFH	010000H to 017FFFH
	SA3	0	0	0	0	1	1	X	X	X	X	030000H to 03FFFFH	018000H to 01FFFFH
	SA4	0	0	0	1	0	0	X	X	X	X	040000H to 04FFFFH	020000H to 027FFFH
	SA5	0	0	0	1	0	1	X	X	X	X	050000H to 05FFFFH	028000H to 02FFFFH
	SA6	0	0	0	1	1	0	X	X	X	X	060000H to 06FFFFH	030000H to 037FFFH
	SA7	0	0	0	1	1	1	X	X	X	X	070000H to 07FFFFH	038000H to 03FFFFH
	SA8	0	0	1	0	0	0	X	X	X	X	080000H to 08FFFFH	040000H to 047FFFH
	SA9	0	0	1	0	0	1	X	X	X	X	090000H to 09FFFFH	048000H to 04FFFFH
	SA10	0	0	1	0	1	0	X	X	X	X	0A0000H to 0AFFFFH	050000H to 057FFFH
	SA11	0	0	1	0	1	1	X	X	X	X	0B0000H to 0BFFFFH	058000H to 05FFFFH
	SA12	0	0	1	1	0	0	X	X	X	X	0C0000H to 0CFFFFH	060000H to 067FFFH
	SA13	0	0	1	1	0	1	X	X	X	X	0D0000H to 0DFFFFH	068000H to 06FFFFH
	SA14	0	0	1	1	1	0	X	X	X	X	0E0000H to 0EFFFFH	070000H to 077FFFH
	SA15	0	0	1	1	1	1	X	X	X	X	0F0000H to 0FFFFFH	078000H to 07FFFFH
	SA16	0	1	0	0	0	0	X	X	X	X	100000H to 10FFFFH	080000H to 087FFFH
	SA17	0	1	0	0	0	1	X	X	X	X	110000H to 11FFFFH	088000H to 08FFFFH
	SA18	0	1	0	0	1	0	X	X	X	X	120000H to 12FFFFH	090000H to 097FFFH
	SA19	0	1	0	0	1	1	X	X	X	X	130000H to 13FFFFH	098000H to 09FFFFH
	SA20	0	1	0	1	0	0	X	X	X	X	140000H to 14FFFFH	0A0000H to 0A7FFFH
	SA21	0	1	0	1	0	1	X	X	X	X	150000H to 15FFFFH	0A8000H to 0AFFFFH
	SA22	0	1	0	1	1	0	X	X	X	X	160000H to 16FFFFH	0B0000H to 0B7FFFH
	SA23	0	1	0	1	1	1	X	X	X	X	170000H to 17FFFFH	0B8000H to 0BFFFFH
	SA24	0	1	1	0	0	0	X	X	X	X	180000H to 18FFFFH	0C0000H to 0C7FFFH
	SA25	0	1	1	0	0	1	X	X	X	X	190000H to 19FFFFH	0C8000H to 0CFFFFH
	SA26	0	1	1	0	1	0	X	X	X	X	1A0000H to 1AFFFFH	0D0000H to 0D7FFFH
	SA27	0	1	1	0	1	1	X	X	X	X	1B0000H to 1BFFFFH	0D8000H to 0DFFFFH
	SA28	0	1	1	1	0	0	X	X	X	X	1C0000H to 1CFFFFH	0E0000H to 0E7FFFH
	SA29	0	1	1	1	0	1	X	X	X	X	1D0000H to 1DFFFFH	0E8000H to 0EFFFFH
	SA30	0	1	1	1	1	0	X	X	X	X	1E0000H to 1EFFFFH	0F0000H to 0F7FFFH
	SA31	0	1	1	1	1	1	X	X	X	X	1F0000H to 1FFFFFH	0F8000H to 0FFFFFH

(Continued)

MB84VD2218X/2218XA/2219X/2219XA-10

(Continued)

Bank	Sector	Sector Address										Address Range (BYTE mode)	Address Range (WORD mode)
		Bank Address											
		A20	A19	A18	A17	A16	A15	A14	A13	A12	A11		
Bank 2	SA32	1	0	0	0	0	0	X	X	X	X	200000H to 20FFFFH	100000H to 107FFFFH
	SA33	1	0	0	0	0	1	X	X	X	X	210000H to 21FFFFH	108000H to 10FFFFH
	SA34	1	0	0	0	1	0	X	X	X	X	220000H to 22FFFFH	110000H to 117FFFFH
	SA35	1	0	0	0	1	1	X	X	X	X	230000H to 23FFFFH	118000H to 11FFFFH
	SA36	1	0	0	1	0	0	X	X	X	X	240000H to 24FFFFH	120000H to 127FFFFH
	SA37	1	0	0	1	0	1	X	X	X	X	250000H to 25FFFFH	128000H to 12FFFFH
	SA38	1	0	0	1	1	0	X	X	X	X	260000H to 26FFFFH	130000H to 137FFFFH
	SA39	1	0	0	1	1	1	X	X	X	X	270000H to 27FFFFH	138000H to 13FFFFH
	SA40	1	0	1	0	0	0	X	X	X	X	280000H to 28FFFFH	140000H to 147FFFFH
	SA41	1	0	1	0	0	1	X	X	X	X	290000H to 29FFFFH	148000H to 14FFFFH
	SA42	1	0	1	0	1	0	X	X	X	X	2A0000H to 2AFFFFH	150000H to 157FFFFH
	SA43	1	0	1	0	1	1	X	X	X	X	2B0000H to 2BFFFFH	158000H to 15FFFFH
	SA44	1	0	1	1	0	0	X	X	X	X	2C0000H to 2CFFFFH	160000H to 167FFFFH
	SA45	1	0	1	1	0	1	X	X	X	X	2D0000H to 2DFFFFH	168000H to 16FFFFH
	SA46	1	0	1	1	1	0	X	X	X	X	2E0000H to 2EFFFFH	170000H to 177FFFFH
	SA47	1	0	1	1	1	1	X	X	X	X	2F0000H to 2FFFFFFH	178000H to 17FFFFH
	SA48	1	1	0	0	0	0	X	X	X	X	300000H to 30FFFFH	180000H to 187FFFFH
	SA49	1	1	0	0	0	1	X	X	X	X	310000H to 31FFFFH	188000H to 18FFFFH
	SA50	1	1	0	0	1	0	X	X	X	X	320000H to 32FFFFH	190000H to 197FFFFH
	SA51	1	1	0	0	1	1	X	X	X	X	330000H to 33FFFFH	198000H to 19FFFFH
SA52	1	1	0	1	0	0	X	X	X	X	340000H to 34FFFFH	1A0000H to 1A7FFFFH	
SA53	1	1	0	1	0	1	X	X	X	X	350000H to 35FFFFH	1A8000H to 1AFFFFH	
SA54	1	1	0	1	1	0	X	X	X	X	360000H to 36FFFFH	1B0000H to 1B7FFFFH	
SA55	1	1	0	1	1	1	X	X	X	X	370000H to 37FFFFH	1B8000H to 1BFFFFH	
Bank 1	SA56	1	1	1	0	0	0	X	X	X	X	380000H to 38FFFFH	1C0000H to 1C7FFFFH
	SA57	1	1	1	0	0	1	X	X	X	X	390000H to 39FFFFH	1C8000H to 1CFFFFH
	SA58	1	1	1	0	1	0	X	X	X	X	3A0000H to 3AFFFFH	1D0000H to 1D7FFFFH
	SA59	1	1	1	0	1	1	X	X	X	X	3B0000H to 3BFFFFH	1D8000H to 1DFFFFH
	SA60	1	1	1	1	0	0	X	X	X	X	3C0000H to 3CFFFFH	1E0000H to 1E7FFFFH
	SA61	1	1	1	1	0	1	X	X	X	X	3D0000H to 3DFFFFH	1E8000H to 1EFFFFH
	SA62	1	1	1	1	1	0	X	X	X	X	3E0000H to 3EFFFFH	1F0000H to 1F7FFFFH
	SA63	1	1	1	1	1	1	0	0	0	X	3F0000H to 3F1FFFFH	1F8000H to 1F8FFFFH
	SA64	1	1	1	1	1	1	0	0	1	X	3F2000H to 3F3FFFFH	1F9000H to 1F9FFFFH
	SA65	1	1	1	1	1	1	0	1	0	X	3F4000H to 3F5FFFFH	1FA000H to 1FAFFFFH
	SA66	1	1	1	1	1	1	0	1	1	X	3F6000H to 3F7FFFFH	1FB000H to 1FBFFFFH
	SA67	1	1	1	1	1	1	1	0	0	X	3F8000H to 3F9FFFFH	1FC000H to 1FCFFFFH
	SA68	1	1	1	1	1	1	1	0	1	X	3FA000H to 3FAFFFFH	1FD000H to 1DFFFFH
	SA69	1	1	1	1	1	1	1	1	0	X	3FC000H to 3FCFFFFH	1FE000H to 1FEFFFFH
	SA70	1	1	1	1	1	1	1	1	1	X	3FE000H to 3FFFFFFH	1FF000H to 1FFFFFFH

MB84VD2218X/2218XA/2219X/2219XA-10

Table 2.4 Sector Address Tables (MB84VD22192/A)

Bank	Sector	Sector Address										Address Range (BYTE mode)	Address Range (WORD mode)
		Bank Address											
		A ₂₀	A ₁₉	A ₁₈	A ₁₇	A ₁₆	A ₁₅	A ₁₄	A ₁₃	A ₁₂	A ₁₁		
Bank 1	SA0	0	0	0	0	0	0	0	0	0	X	000000H to 001FFFFH	000000H to 000FFFFH
	SA1	0	0	0	0	0	0	0	0	1	X	002000H to 003FFFFH	001000H to 001FFFFH
	SA2	0	0	0	0	0	0	0	1	0	X	004000H to 005FFFFH	002000H to 002FFFFH
	SA3	0	0	0	0	0	0	0	1	1	X	006000H to 007FFFFH	003000H to 003FFFFH
	SA4	0	0	0	0	0	0	1	0	0	X	008000H to 009FFFFH	004000H to 004FFFFH
	SA5	0	0	0	0	0	0	1	0	1	X	00A000H to 00BFFFFH	005000H to 005FFFFH
	SA6	0	0	0	0	0	0	1	1	0	X	00C000H to 00DFFFFH	006000H to 006FFFFH
	SA7	0	0	0	0	0	0	1	1	1	X	00E000H to 00FFFFFFH	007000H to 007FFFFH
	SA8	0	0	0	0	0	1	X	X	X	X	010000H to 01FFFFFFH	008000H to 00FFFFFFH
	SA9	0	0	0	0	1	0	X	X	X	X	020000H to 02FFFFFFH	010000H to 017FFFFH
	SA10	0	0	0	0	1	1	X	X	X	X	030000H to 03FFFFFFH	018000H to 01FFFFFFH
	SA11	0	0	0	1	0	0	X	X	X	X	040000H to 04FFFFFFH	020000H to 027FFFFH
	SA12	0	0	0	1	0	1	X	X	X	X	050000H to 05FFFFFFH	028000H to 02FFFFFFH
	SA13	0	0	0	1	1	0	X	X	X	X	060000H to 06FFFFFFH	030000H to 037FFFFH
SA14	0	0	0	1	1	1	X	X	X	X	070000H to 07FFFFFFH	038000H to 03FFFFFFH	
Bank 2	SA15	0	0	1	0	0	0	X	X	X	X	080000H to 08FFFFFFH	040000H to 047FFFFH
	SA16	0	0	1	0	0	1	X	X	X	X	090000H to 09FFFFFFH	048000H to 04FFFFFFH
	SA17	0	0	1	0	1	0	X	X	X	X	0A0000H to 0AFFFFFFH	050000H to 057FFFFH
	SA18	0	0	1	0	1	1	X	X	X	X	0B0000H to 0BFFFFFFH	058000H to 05FFFFFFH
	SA19	0	0	1	1	0	0	X	X	X	X	0C0000H to 0CFFFFFFH	060000H to 067FFFFH
	SA20	0	0	1	1	0	1	X	X	X	X	0D0000H to 0DFFFFFFH	068000H to 06FFFFFFH
	SA21	0	0	1	1	1	0	X	X	X	X	0E0000H to 0EFFFFFFH	070000H to 077FFFFH
	SA22	0	0	1	1	1	1	X	X	X	X	0F0000H to 0FFFFFFH	078000H to 07FFFFFFH
	SA23	0	1	0	0	0	0	X	X	X	X	100000H to 10FFFFFFH	080000H to 087FFFFH
	SA24	0	1	0	0	0	1	X	X	X	X	110000H to 11FFFFFFH	088000H to 08FFFFFFH
	SA25	0	1	0	0	1	0	X	X	X	X	120000H to 12FFFFFFH	090000H to 097FFFFH
	SA26	0	1	0	0	1	1	X	X	X	X	130000H to 13FFFFFFH	098000H to 09FFFFFFH
	SA27	0	1	0	1	0	0	X	X	X	X	140000H to 14FFFFFFH	0A0000H to 0A7FFFFH
	SA28	0	1	0	1	0	1	X	X	X	X	150000H to 15FFFFFFH	0A8000H to 0AFFFFFFH
	SA29	0	1	0	1	1	0	X	X	X	X	160000H to 16FFFFFFH	0B0000H to 0B7FFFFH
	SA30	0	1	0	1	1	1	X	X	X	X	170000H to 17FFFFFFH	0B8000H to 0BFFFFFFH
	SA31	0	1	1	0	0	0	X	X	X	X	180000H to 18FFFFFFH	0C0000H to 0C7FFFFH
	SA32	0	1	1	0	0	1	X	X	X	X	190000H to 19FFFFFFH	0C8000H to 0CFFFFFFH
	SA33	0	1	1	0	1	0	X	X	X	X	1A0000H to 1AFFFFFFH	0D0000H to 0D7FFFFH
	SA34	0	1	1	0	1	1	X	X	X	X	1B0000H to 1BFFFFFFH	0D8000H to 0DFFFFFFH
	SA35	0	1	1	1	0	0	X	X	X	X	1C0000H to 1CFFFFFFH	0E0000H to 0E7FFFFH
	SA36	0	1	1	1	0	1	X	X	X	X	1D0000H to 1DFFFFFFH	0E8000H to 0EFFFFFFH

(Continued)

MB84VD2218X/2218XA/2219X/2219XA-10

(Continued)

Bank	Sector	Sector Address										Address Range (BYTE mode)	Address Range (WORD mode)
		Bank Address											
		A ₂₀	A ₁₉	A ₁₈	A ₁₇	A ₁₆	A ₁₅	A ₁₄	A ₁₃	A ₁₂	A ₁₁		
Bank 2	SA37	0	1	1	1	1	0	X	X	X	X	1E0000H to 1EFFFFH	0F0000H to 0F7FFFFH
	SA38	0	1	1	1	1	1	X	X	X	X	1F0000H to 1FFFFFH	0F8000H to 0FFFFFH
	SA39	1	0	0	0	0	0	X	X	X	X	200000H to 20FFFFH	100000H to 107FFFFH
	SA40	1	0	0	0	0	1	X	X	X	X	210000H to 21FFFFH	108000H to 10FFFFH
	SA41	1	0	0	0	1	0	X	X	X	X	220000H to 22FFFFH	110000H to 117FFFFH
	SA42	1	0	0	0	1	1	X	X	X	X	230000H to 23FFFFH	118000H to 11FFFFH
	SA43	1	0	0	1	0	0	X	X	X	X	240000H to 24FFFFH	120000H to 127FFFFH
	SA44	1	0	0	1	0	1	X	X	X	X	250000H to 25FFFFH	128000H to 12FFFFH
	SA45	1	0	0	1	1	0	X	X	X	X	260000H to 26FFFFH	130000H to 137FFFFH
	SA46	1	0	0	1	1	1	X	X	X	X	270000H to 27FFFFH	138000H to 13FFFFH
	SA47	1	0	1	0	0	0	X	X	X	X	280000H to 28FFFFH	140000H to 147FFFFH
	SA48	1	0	1	0	0	1	X	X	X	X	290000H to 29FFFFH	148000H to 14FFFFH
	SA49	1	0	1	0	1	0	X	X	X	X	2A0000H to 2AFFFFH	150000H to 157FFFFH
	SA50	1	0	1	0	1	1	X	X	X	X	2B0000H to 2BFFFFH	158000H to 15FFFFH
	SA51	1	0	1	1	0	0	X	X	X	X	2C0000H to 2CFFFFH	160000H to 167FFFFH
	SA52	1	0	1	1	0	1	X	X	X	X	2D0000H to 2DFFFFH	168000H to 16FFFFH
	SA53	1	0	1	1	1	0	X	X	X	X	2E0000H to 2EFFFFH	170000H to 177FFFFH
	SA54	1	0	1	1	1	1	X	X	X	X	2F0000H to 2FFFFFH	178000H to 17FFFFH
	SA55	1	1	0	0	0	0	X	X	X	X	300000H to 30FFFFH	180000H to 187FFFFH
	SA56	1	1	0	0	0	1	X	X	X	X	310000H to 31FFFFH	188000H to 18FFFFH
	SA57	1	1	0	0	1	0	X	X	X	X	320000H to 32FFFFH	190000H to 197FFFFH
	SA58	1	1	0	0	1	1	X	X	X	X	330000H to 33FFFFH	198000H to 19FFFFH
	SA59	1	1	0	1	0	0	X	X	X	X	340000H to 34FFFFH	1A0000H to 1A7FFFFH
	SA60	1	1	0	1	0	1	X	X	X	X	350000H to 35FFFFH	1A8000H to 1AFFFFH
	SA61	1	1	0	1	1	0	X	X	X	X	360000H to 36FFFFH	1B0000H to 1B7FFFFH
	SA62	1	1	0	1	1	1	X	X	X	X	370000H to 37FFFFH	1B8000H to 1BFFFFH
	SA63	1	1	1	0	0	0	X	X	X	X	380000H to 38FFFFH	1C0000H to 1C7FFFFH
	SA64	1	1	1	0	0	1	X	X	X	X	390000H to 39FFFFH	1C8000H to 1CFFFFH
	SA65	1	1	1	0	1	0	X	X	X	X	3A0000H to 3AFFFFH	1D0000H to 1D7FFFFH
	SA66	1	1	1	0	1	1	X	X	X	X	3B0000H to 3BFFFFH	1D8000H to 1DFFFFH
	SA67	1	1	1	1	0	0	X	X	X	X	3C0000H to 3CFFFFH	1E0000H to 1E7FFFFH
	SA68	1	1	1	1	0	1	X	X	X	X	3D0000H to 3DFFFFH	1E8000H to 1EFFFFH
	SA69	1	1	1	1	1	0	X	X	X	X	3E0000H to 3EFFFFH	1F0000H to 1F7FFFFH
	SA70	1	1	1	1	1	1	X	X	X	X	3F0000H to 3FFFFFH	1F8000H to 1FFFFFH

MB84VD2218X/2218XA/2219X/2219XA-10

Table 2.5 Sector Address Tables (MB84VD22183/A)

Bank	Sector	Sector Address										Address Range (BYTE mode)	Address Range (WORD mode)
		Bank Address											
		A ₂₀	A ₁₉	A ₁₈	A ₁₇	A ₁₆	A ₁₅	A ₁₄	A ₁₃	A ₁₂	A ₁₁		
Bank 2	SA0	0	0	0	0	0	0	X	X	X	X	000000H to 00FFFFH	000000H to 007FFFH
	SA1	0	0	0	0	0	1	X	X	X	X	010000H to 01FFFFH	008000H to 00FFFFH
	SA2	0	0	0	0	1	0	X	X	X	X	020000H to 02FFFFH	010000H to 017FFFH
	SA3	0	0	0	0	1	1	X	X	X	X	030000H to 03FFFFH	018000H to 01FFFFH
	SA4	0	0	0	1	0	0	X	X	X	X	040000H to 04FFFFH	020000H to 027FFFH
	SA5	0	0	0	1	0	1	X	X	X	X	050000H to 05FFFFH	028000H to 02FFFFH
	SA6	0	0	0	1	1	0	X	X	X	X	060000H to 06FFFFH	030000H to 037FFFH
	SA7	0	0	0	1	1	1	X	X	X	X	070000H to 07FFFFH	038000H to 03FFFFH
	SA8	0	0	1	0	0	0	X	X	X	X	080000H to 08FFFFH	040000H to 047FFFH
	SA9	0	0	1	0	0	1	X	X	X	X	090000H to 09FFFFH	048000H to 04FFFFH
	SA10	0	0	1	0	1	0	X	X	X	X	0A0000H to 0AFFFFH	050000H to 057FFFH
	SA11	0	0	1	0	1	1	X	X	X	X	0B0000H to 0BFFFFH	058000H to 05FFFFH
	SA12	0	0	1	1	0	0	X	X	X	X	0C0000H to 0CFFFFH	060000H to 067FFFH
	SA13	0	0	1	1	0	1	X	X	X	X	0D0000H to 0DFFFFH	068000H to 06FFFFH
	SA14	0	0	1	1	1	0	X	X	X	X	0E0000H to 0EFFFFH	070000H to 077FFFH
	SA15	0	0	1	1	1	1	X	X	X	X	0F0000H to 0FFFFFH	078000H to 07FFFFH
	SA16	0	1	0	0	0	0	X	X	X	X	100000H to 10FFFFH	080000H to 087FFFH
	SA17	0	1	0	0	0	1	X	X	X	X	110000H to 11FFFFH	088000H to 08FFFFH
	SA18	0	1	0	0	1	0	X	X	X	X	120000H to 12FFFFH	090000H to 097FFFH
	SA19	0	1	0	0	1	1	X	X	X	X	130000H to 13FFFFH	098000H to 09FFFFH
	SA20	0	1	0	1	0	0	X	X	X	X	140000H to 14FFFFH	0A0000H to 0A7FFFH
	SA21	0	1	0	1	0	1	X	X	X	X	150000H to 15FFFFH	0A8000H to 0AFFFFH
	SA22	0	1	0	1	1	0	X	X	X	X	160000H to 16FFFFH	0B0000H to 0B7FFFH
	SA23	0	1	0	1	1	1	X	X	X	X	170000H to 17FFFFH	0B8000H to 0BFFFFH
	SA24	0	1	1	0	0	0	X	X	X	X	180000H to 18FFFFH	0C0000H to 0C7FFFH
	SA25	0	1	1	0	0	1	X	X	X	X	190000H to 19FFFFH	0C8000H to 0CFFFFH
	SA26	0	1	1	0	1	0	X	X	X	X	1A0000H to 1AFFFFH	0D0000H to 0D7FFFH
	SA27	0	1	1	0	1	1	X	X	X	X	1B0000H to 1BFFFFH	0D8000H to 0DFFFFH
	SA28	0	1	1	1	0	0	X	X	X	X	1C0000H to 1CFFFFH	0E0000H to 0E7FFFH
	SA29	0	1	1	1	0	1	X	X	X	X	1D0000H to 1DFFFFH	0E8000H to 0EFFFFH
	SA30	0	1	1	1	1	0	X	X	X	X	1E0000H to 1EFFFFH	0F0000H to 0F7FFFH
	SA31	0	1	1	1	1	1	X	X	X	X	1F0000H to 1FFFFFH	0F8000H to 0FFFFFH

(Continued)

MB84VD2218X/2218XA/2219X/2219XA-10

(Continued)

Bank	Sector	Sector Address										Address Range (BYTE mode)	Address Range (WORD mode)
		Bank Address											
		A20	A19	A18	A17	A16	A15	A14	A13	A12	A11		
Bank 2	SA32	1	0	0	0	0	0	X	X	X	X	200000H to 20FFFFH	100000H to 107FFFFH
	SA33	1	0	0	0	0	1	X	X	X	X	210000H to 21FFFFH	108000H to 10FFFFH
	SA34	1	0	0	0	1	0	X	X	X	X	220000H to 22FFFFH	110000H to 117FFFFH
	SA35	1	0	0	0	1	1	X	X	X	X	230000H to 23FFFFH	118000H to 11FFFFH
	SA36	1	0	0	1	0	0	X	X	X	X	240000H to 24FFFFH	120000H to 127FFFFH
	SA37	1	0	0	1	0	1	X	X	X	X	250000H to 25FFFFH	128000H to 12FFFFH
	SA38	1	0	0	1	1	0	X	X	X	X	260000H to 26FFFFH	130000H to 137FFFFH
	SA39	1	0	0	1	1	1	X	X	X	X	270000H to 27FFFFH	138000H to 13FFFFH
	SA40	1	0	1	0	0	0	X	X	X	X	280000H to 28FFFFH	140000H to 147FFFFH
	SA41	1	0	1	0	0	1	X	X	X	X	290000H to 29FFFFH	148000H to 14FFFFH
	SA42	1	0	1	0	1	0	X	X	X	X	2A0000H to 2AFFFFH	150000H to 157FFFFH
	SA43	1	0	1	0	1	1	X	X	X	X	2B0000H to 2BFFFFH	158000H to 15FFFFH
	SA44	1	0	1	1	0	0	X	X	X	X	2C0000H to 2CFFFFH	160000H to 167FFFFH
	SA45	1	0	1	1	0	1	X	X	X	X	2D0000H to 2DFFFFH	168000H to 16FFFFH
	SA46	1	0	1	1	1	0	X	X	X	X	2E0000H to 2EFFFFH	170000H to 177FFFFH
	SA47	1	0	1	1	1	1	X	X	X	X	2F0000H to 2FFFFFFH	178000H to 17FFFFH
Bank 1	SA48	1	1	0	0	0	0	X	X	X	X	300000H to 30FFFFH	180000H to 187FFFFH
	SA49	1	1	0	0	0	1	X	X	X	X	310000H to 31FFFFH	188000H to 18FFFFH
	SA50	1	1	0	0	1	0	X	X	X	X	320000H to 32FFFFH	190000H to 197FFFFH
	SA51	1	1	0	0	1	1	X	X	X	X	330000H to 33FFFFH	198000H to 19FFFFH
	SA52	1	1	0	1	0	0	X	X	X	X	340000H to 34FFFFH	1A0000H to 1A7FFFFH
	SA53	1	1	0	1	0	1	X	X	X	X	350000H to 35FFFFH	1A8000H to 1AFFFFH
	SA54	1	1	0	1	1	0	X	X	X	X	360000H to 36FFFFH	1B0000H to 1B7FFFFH
	SA55	1	1	0	1	1	1	X	X	X	X	370000H to 37FFFFH	1B8000H to 1BFFFFH
	SA56	1	1	1	0	0	0	X	X	X	X	380000H to 38FFFFH	1C0000H to 1C7FFFFH
	SA57	1	1	1	0	0	1	X	X	X	X	390000H to 39FFFFH	1C8000H to 1CFFFFH
	SA58	1	1	1	0	1	0	X	X	X	X	3A0000H to 3AFFFFH	1D0000H to 1D7FFFFH
	SA59	1	1	1	0	1	1	X	X	X	X	3B0000H to 3BFFFFH	1D8000H to 1DFFFFH
	SA60	1	1	1	1	0	0	X	X	X	X	3C0000H to 3CFFFFH	1E0000H to 1E7FFFFH
	SA61	1	1	1	1	0	1	X	X	X	X	3D0000H to 3DFFFFH	1E8000H to 1EFFFFH
	SA62	1	1	1	1	1	0	X	X	X	X	3E0000H to 3EFFFFH	1F0000H to 1F7FFFFH
	SA63	1	1	1	1	1	1	0	0	0	X	3F0000H to 3F1FFFFH	1F8000H to 1F8FFFFH
	SA64	1	1	1	1	1	1	0	0	1	X	3F2000H to 3F3FFFFH	1F9000H to 1F9FFFFH
	SA65	1	1	1	1	1	1	0	1	0	X	3F4000H to 3F5FFFFH	1FA000H to 1FAFFFFH
	SA66	1	1	1	1	1	1	0	1	1	X	3F6000H to 3F7FFFFH	1FB000H to 1FBFFFFH
	SA67	1	1	1	1	1	1	1	0	0	X	3F8000H to 3F9FFFFH	1FC000H to 1FCFFFFH
	SA68	1	1	1	1	1	1	1	0	1	X	3FA000H to 3FAFFFFH	1FD000H to 1FDFFFFH
	SA69	1	1	1	1	1	1	1	1	0	X	3FC000H to 3FCFFFFH	1FE000H to 1FEFFFFH
	SA70	1	1	1	1	1	1	1	1	1	X	3FE000H to 3FFFFFFH	1FF000H to 1FFFFFFH

MB84VD2218X/2218XA/2219X/2219XA-10

Table 2.6 Sector Address Tables (MB84VD22193/A)

Bank	Sector	Sector Address										Address Range (BYTE mode)	Address Range (WORD mode)
		Bank Address											
		A ₂₀	A ₁₉	A ₁₈	A ₁₇	A ₁₆	A ₁₅	A ₁₄	A ₁₃	A ₁₂	A ₁₁		
Bank 1	SA0	0	0	0	0	0	0	0	0	0	X	000000H to 001FFFFH	000000H to 000FFFFH
	SA1	0	0	0	0	0	0	0	0	1	X	002000H to 003FFFFH	001000H to 001FFFFH
	SA2	0	0	0	0	0	0	0	1	0	X	004000H to 005FFFFH	002000H to 002FFFFH
	SA3	0	0	0	0	0	0	0	1	1	X	006000H to 007FFFFH	003000H to 003FFFFH
	SA4	0	0	0	0	0	0	1	0	0	X	008000H to 009FFFFH	004000H to 004FFFFH
	SA5	0	0	0	0	0	0	1	0	1	X	00A000H to 00BFFFFH	005000H to 005FFFFH
	SA6	0	0	0	0	0	0	1	1	0	X	00C000H to 00DFFFFH	006000H to 006FFFFH
	SA7	0	0	0	0	0	0	1	1	1	X	00E000H to 00FFFFFFH	007000H to 007FFFFH
	SA8	0	0	0	0	0	1	X	X	X	X	010000H to 01FFFFFFH	008000H to 00FFFFFFH
	SA9	0	0	0	0	1	0	X	X	X	X	020000H to 02FFFFFFH	010000H to 017FFFFH
	SA10	0	0	0	0	1	1	X	X	X	X	030000H to 03FFFFFFH	018000H to 01FFFFFFH
	SA11	0	0	0	1	0	0	X	X	X	X	040000H to 04FFFFFFH	020000H to 027FFFFH
	SA12	0	0	0	1	0	1	X	X	X	X	050000H to 05FFFFFFH	028000H to 02FFFFFFH
	SA13	0	0	0	1	1	0	X	X	X	X	060000H to 06FFFFFFH	030000H to 037FFFFH
	SA14	0	0	0	1	1	1	X	X	X	X	070000H to 07FFFFFFH	038000H to 03FFFFFFH
	SA15	0	0	1	0	0	0	X	X	X	X	080000H to 08FFFFFFH	040000H to 047FFFFH
	SA16	0	0	1	0	0	1	X	X	X	X	090000H to 09FFFFFFH	048000H to 04FFFFFFH
	SA17	0	0	1	0	1	0	X	X	X	X	0A0000H to 0AFFFFFFH	050000H to 057FFFFH
	SA18	0	0	1	0	1	1	X	X	X	X	0B0000H to 0BFFFFFFH	058000H to 05FFFFFFH
	SA19	0	0	1	1	0	0	X	X	X	X	0C0000H to 0CFFFFFFH	060000H to 067FFFFH
	SA20	0	0	1	1	0	1	X	X	X	X	0D0000H to 0DFFFFFFH	068000H to 06FFFFFFH
	SA21	0	0	1	1	1	0	X	X	X	X	0E0000H to 0EFFFFFFH	070000H to 077FFFFH
SA22	0	0	1	1	1	1	X	X	X	X	0F0000H to 0FFFFFFH	078000H to 07FFFFFFH	
Bank 2	SA23	0	1	0	0	0	0	X	X	X	X	100000H to 10FFFFFFH	080000H to 087FFFFH
	SA24	0	1	0	0	0	1	X	X	X	X	110000H to 11FFFFFFH	088000H to 08FFFFFFH
	SA25	0	1	0	0	1	0	X	X	X	X	120000H to 12FFFFFFH	090000H to 097FFFFH
	SA26	0	1	0	0	1	1	X	X	X	X	130000H to 13FFFFFFH	098000H to 09FFFFFFH
	SA27	0	1	0	1	0	0	X	X	X	X	140000H to 14FFFFFFH	0A0000H to 0A7FFFFH
	SA28	0	1	0	1	0	1	X	X	X	X	150000H to 15FFFFFFH	0A8000H to 0AFFFFFFH
	SA29	0	1	0	1	1	0	X	X	X	X	160000H to 16FFFFFFH	0B0000H to 0B7FFFFH
	SA30	0	1	0	1	1	1	X	X	X	X	170000H to 17FFFFFFH	0B8000H to 0BFFFFFFH
	SA31	0	1	1	0	0	0	X	X	X	X	180000H to 18FFFFFFH	0C0000H to 0C7FFFFH
	SA32	0	1	1	0	0	1	X	X	X	X	190000H to 19FFFFFFH	0C8000H to 0CFFFFFFH
	SA33	0	1	1	0	1	0	X	X	X	X	1A0000H to 1AFFFFFFH	0D0000H to 0D7FFFFH
	SA34	0	1	1	0	1	1	X	X	X	X	1B0000H to 1BFFFFFFH	0D8000H to 0DFFFFFFH
	SA35	0	1	1	1	0	0	X	X	X	X	1C0000H to 1CFFFFFFH	0E0000H to 0E7FFFFH
	SA36	0	1	1	1	0	1	X	X	X	X	1D0000H to 1DFFFFFFH	0E8000H to 0EFFFFFFH

(Continued)

MB84VD2218X/2218XA/2219X/2219XA-10

(Continued)

Bank	Sector	Sector Address										Address Range (BYTE mode)	Address Range (WORD mode)
		Bank Address											
		A ₂₀	A ₁₉	A ₁₈	A ₁₇	A ₁₆	A ₁₅	A ₁₄	A ₁₃	A ₁₂	A ₁₁		
Bank 2	SA37	0	1	1	1	1	0	X	X	X	X	1E0000H to 1EFFFFH	0F0000H to 0F7FFFFH
	SA38	0	1	1	1	1	1	X	X	X	X	1F0000H to 1FFFFFH	0F8000H to 0FFFFFH
	SA39	1	0	0	0	0	0	X	X	X	X	200000H to 20FFFFH	100000H to 107FFFFH
	SA40	1	0	0	0	0	1	X	X	X	X	210000H to 21FFFFH	108000H to 10FFFFH
	SA41	1	0	0	0	1	0	X	X	X	X	220000H to 22FFFFH	110000H to 117FFFFH
	SA42	1	0	0	0	1	1	X	X	X	X	230000H to 23FFFFH	118000H to 11FFFFH
	SA43	1	0	0	1	0	0	X	X	X	X	240000H to 24FFFFH	120000H to 127FFFFH
	SA44	1	0	0	1	0	1	X	X	X	X	250000H to 25FFFFH	128000H to 12FFFFH
	SA45	1	0	0	1	1	0	X	X	X	X	260000H to 26FFFFH	130000H to 137FFFFH
	SA46	1	0	0	1	1	1	X	X	X	X	270000H to 27FFFFH	138000H to 13FFFFH
	SA47	1	0	1	0	0	0	X	X	X	X	280000H to 28FFFFH	140000H to 147FFFFH
	SA48	1	0	1	0	0	1	X	X	X	X	290000H to 29FFFFH	148000H to 14FFFFH
	SA49	1	0	1	0	1	0	X	X	X	X	2A0000H to 2AFFFFH	150000H to 157FFFFH
	SA50	1	0	1	0	1	1	X	X	X	X	2B0000H to 2BFFFFH	158000H to 15FFFFH
	SA51	1	0	1	1	0	0	X	X	X	X	2C0000H to 2CFFFFH	160000H to 167FFFFH
	SA52	1	0	1	1	0	1	X	X	X	X	2D0000H to 2DFFFFH	168000H to 16FFFFH
	SA53	1	0	1	1	1	0	X	X	X	X	2E0000H to 2EFFFFH	170000H to 177FFFFH
	SA54	1	0	1	1	1	1	X	X	X	X	2F0000H to 2FFFFFH	178000H to 17FFFFH
	SA55	1	1	0	0	0	0	X	X	X	X	300000H to 30FFFFH	180000H to 187FFFFH
	SA56	1	1	0	0	0	1	X	X	X	X	310000H to 31FFFFH	188000H to 18FFFFH
	SA57	1	1	0	0	1	0	X	X	X	X	320000H to 32FFFFH	190000H to 197FFFFH
	SA58	1	1	0	0	1	1	X	X	X	X	330000H to 33FFFFH	198000H to 19FFFFH
	SA59	1	1	0	1	0	0	X	X	X	X	340000H to 34FFFFH	1A0000H to 1A7FFFFH
	SA60	1	1	0	1	0	1	X	X	X	X	350000H to 35FFFFH	1A8000H to 1AFFFFH
	SA61	1	1	0	1	1	0	X	X	X	X	360000H to 36FFFFH	1B0000H to 1B7FFFFH
	SA62	1	1	0	1	1	1	X	X	X	X	370000H to 37FFFFH	1B8000H to 1BFFFFH
	SA63	1	1	1	0	0	0	X	X	X	X	380000H to 38FFFFH	1C0000H to 1C7FFFFH
	SA64	1	1	1	0	0	1	X	X	X	X	390000H to 39FFFFH	1C8000H to 1CFFFFH
	SA65	1	1	1	0	1	0	X	X	X	X	3A0000H to 3AFFFFH	1D0000H to 1D7FFFFH
	SA66	1	1	1	0	1	1	X	X	X	X	3B0000H to 3BFFFFH	1D8000H to 1DFFFFH
	SA67	1	1	1	1	0	0	X	X	X	X	3C0000H to 3CFFFFH	1E0000H to 1E7FFFFH
	SA68	1	1	1	1	0	1	X	X	X	X	3D0000H to 3DFFFFH	1E8000H to 1EFFFFH
	SA69	1	1	1	1	1	0	X	X	X	X	3E0000H to 3EFFFFH	1F0000H to 1F7FFFFH
	SA70	1	1	1	1	1	1	X	X	X	X	3F0000H to 3FFFFFH	1F8000H to 1FFFFFH

MB84VD2218X/2218XA/2219X/2219XA-10

Table 2.7 Sector Address Tables (MB84VD22184/A)

Bank	Sector	Sector Address										Address Range (BYTE mode)	Address Range (WORD mode)
		Bank Address											
		A ₂₀	A ₁₉	A ₁₈	A ₁₇	A ₁₆	A ₁₅	A ₁₄	A ₁₃	A ₁₂	A ₁₁		
Bank 2	SA0	0	0	0	0	0	0	X	X	X	X	000000H to 00FFFFH	000000H to 007FFFH
	SA1	0	0	0	0	0	1	X	X	X	X	010000H to 01FFFFH	008000H to 00FFFFH
	SA2	0	0	0	0	1	0	X	X	X	X	020000H to 02FFFFH	010000H to 017FFFH
	SA3	0	0	0	0	1	1	X	X	X	X	030000H to 03FFFFH	018000H to 01FFFFH
	SA4	0	0	0	1	0	0	X	X	X	X	040000H to 04FFFFH	020000H to 027FFFH
	SA5	0	0	0	1	0	1	X	X	X	X	050000H to 05FFFFH	028000H to 02FFFFH
	SA6	0	0	0	1	1	0	X	X	X	X	060000H to 06FFFFH	030000H to 037FFFH
	SA7	0	0	0	1	1	1	X	X	X	X	070000H to 07FFFFH	038000H to 03FFFFH
	SA8	0	0	1	0	0	0	X	X	X	X	080000H to 08FFFFH	040000H to 047FFFH
	SA9	0	0	1	0	0	1	X	X	X	X	090000H to 09FFFFH	048000H to 04FFFFH
	SA10	0	0	1	0	1	0	X	X	X	X	0A0000H to 0AFFFFH	050000H to 057FFFH
	SA11	0	0	1	0	1	1	X	X	X	X	0B0000H to 0BFFFFH	058000H to 05FFFFH
	SA12	0	0	1	1	0	0	X	X	X	X	0C0000H to 0CFFFFH	060000H to 067FFFH
	SA13	0	0	1	1	0	1	X	X	X	X	0D0000H to 0DFFFFH	068000H to 06FFFFH
	SA14	0	0	1	1	1	0	X	X	X	X	0E0000H to 0EFFFFH	070000H to 077FFFH
	SA15	0	0	1	1	1	1	X	X	X	X	0F0000H to 0FFFFFH	078000H to 07FFFFH
	SA16	0	1	0	0	0	0	X	X	X	X	100000H to 10FFFFH	080000H to 087FFFH
	SA17	0	1	0	0	0	1	X	X	X	X	110000H to 11FFFFH	088000H to 08FFFFH
	SA18	0	1	0	0	1	0	X	X	X	X	120000H to 12FFFFH	090000H to 097FFFH
	SA19	0	1	0	0	1	1	X	X	X	X	130000H to 13FFFFH	098000H to 09FFFFH
	SA20	0	1	0	1	0	0	X	X	X	X	140000H to 14FFFFH	0A0000H to 0A7FFFH
	SA21	0	1	0	1	0	1	X	X	X	X	150000H to 15FFFFH	0A8000H to 0AFFFFH
	SA22	0	1	0	1	1	0	X	X	X	X	160000H to 16FFFFH	0B0000H to 0B7FFFH
	SA23	0	1	0	1	1	1	X	X	X	X	170000H to 17FFFFH	0B8000H to 0BFFFFH
	SA24	0	1	1	0	0	0	X	X	X	X	180000H to 18FFFFH	0C0000H to 0C7FFFH
	SA25	0	1	1	0	0	1	X	X	X	X	190000H to 19FFFFH	0C8000H to 0CFFFFH
	SA26	0	1	1	0	1	0	X	X	X	X	1A0000H to 1AFFFFH	0D0000H to 0D7FFFH
	SA27	0	1	1	0	1	1	X	X	X	X	1B0000H to 1BFFFFH	0D8000H to 0DFFFFH
	SA28	0	1	1	1	0	0	X	X	X	X	1C0000H to 1CFFFFH	0E0000H to 0E7FFFH
	SA29	0	1	1	1	0	1	X	X	X	X	1D0000H to 1DFFFFH	0E8000H to 0EFFFFH
	SA30	0	1	1	1	1	0	X	X	X	X	1E0000H to 1EFFFFH	0F0000H to 0F7FFFH
	SA31	0	1	1	1	1	1	X	X	X	X	1F0000H to 1FFFFFH	0F8000H to 0FFFFFH

(Continued)

MB84VD2218X/2218XA/2219X/2219XA-10

(Continued)

Bank	Sector	Sector Address										Address Range (BYTE mode)	Address Range (WORD mode)
		Bank Address											
		A ₂₀	A ₁₉	A ₁₈	A ₁₇	A ₁₆	A ₁₅	A ₁₄	A ₁₃	A ₁₂	A ₁₁		
Bank 1	SA32	1	0	0	0	0	0	X	X	X	X	200000H to 20FFFFH	100000H to 107FFFFH
	SA33	1	0	0	0	0	1	X	X	X	X	210000H to 21FFFFH	108000H to 10FFFFH
	SA34	1	0	0	0	1	0	X	X	X	X	220000H to 22FFFFH	110000H to 117FFFFH
	SA35	1	0	0	0	1	1	X	X	X	X	230000H to 23FFFFH	118000H to 11FFFFH
	SA36	1	0	0	1	0	0	X	X	X	X	240000H to 24FFFFH	120000H to 127FFFFH
	SA37	1	0	0	1	0	1	X	X	X	X	250000H to 25FFFFH	128000H to 12FFFFH
	SA38	1	0	0	1	1	0	X	X	X	X	260000H to 26FFFFH	130000H to 137FFFFH
	SA39	1	0	0	1	1	1	X	X	X	X	270000H to 27FFFFH	138000H to 13FFFFH
	SA40	1	0	1	0	0	0	X	X	X	X	280000H to 28FFFFH	140000H to 147FFFFH
	SA41	1	0	1	0	0	1	X	X	X	X	290000H to 29FFFFH	148000H to 14FFFFH
	SA42	1	0	1	0	1	0	X	X	X	X	2A0000H to 2AFFFFH	150000H to 157FFFFH
	SA43	1	0	1	0	1	1	X	X	X	X	2B0000H to 2BFFFFH	158000H to 15FFFFH
	SA44	1	0	1	1	0	0	X	X	X	X	2C0000H to 2CFFFFH	160000H to 167FFFFH
	SA45	1	0	1	1	0	1	X	X	X	X	2D0000H to 2DFFFFH	168000H to 16FFFFH
	SA46	1	0	1	1	1	0	X	X	X	X	2E0000H to 2EFFFFH	170000H to 177FFFFH
	SA47	1	0	1	1	1	1	X	X	X	X	2F0000H to 2FFFFFH	178000H to 17FFFFH
	SA48	1	1	0	0	0	0	X	X	X	X	300000H to 30FFFFH	180000H to 187FFFFH
	SA49	1	1	0	0	0	1	X	X	X	X	310000H to 31FFFFH	188000H to 18FFFFH
	SA50	1	1	0	0	1	0	X	X	X	X	320000H to 32FFFFH	190000H to 197FFFFH
	SA51	1	1	0	0	1	1	X	X	X	X	330000H to 33FFFFH	198000H to 19FFFFH
	SA52	1	1	0	1	0	0	X	X	X	X	340000H to 34FFFFH	1A0000H to 1A7FFFFH
	SA53	1	1	0	1	0	1	X	X	X	X	350000H to 35FFFFH	1A8000H to 1AFFFFH
	SA54	1	1	0	1	1	0	X	X	X	X	360000H to 36FFFFH	1B0000H to 1B7FFFFH
	SA55	1	1	0	1	1	1	X	X	X	X	370000H to 37FFFFH	1B8000H to 1BFFFFH
	SA56	1	1	1	0	0	0	X	X	X	X	380000H to 38FFFFH	1C0000H to 1C7FFFFH
	SA57	1	1	1	0	0	1	X	X	X	X	390000H to 39FFFFH	1C8000H to 1CFFFFH
	SA58	1	1	1	0	1	0	X	X	X	X	3A0000H to 3AFFFFH	1D0000H to 1D7FFFFH
	SA59	1	1	1	0	1	1	X	X	X	X	3B0000H to 3BFFFFH	1D8000H to 1DFFFFH
	SA60	1	1	1	1	0	0	X	X	X	X	3C0000H to 3CFFFFH	1E0000H to 1E7FFFFH
	SA61	1	1	1	1	0	1	X	X	X	X	3D0000H to 3DFFFFH	1E8000H to 1EFFFFH
	SA62	1	1	1	1	1	0	X	X	X	X	3E0000H to 3EFFFFH	1F0000H to 1F7FFFFH
	SA63	1	1	1	1	1	1	0	0	0	X	3F0000H to 3F1FFFFH	1F8000H to 1F8FFFFH
	SA64	1	1	1	1	1	1	0	0	1	X	3F2000H to 3F3FFFFH	1F9000H to 1F9FFFFH
	SA65	1	1	1	1	1	1	0	1	0	X	3F4000H to 3F5FFFFH	1FA000H to 1FAFFFFH
	SA66	1	1	1	1	1	1	0	1	1	X	3F6000H to 3F7FFFFH	1FB000H to 1FBFFFFH
	SA67	1	1	1	1	1	1	1	0	0	X	3F8000H to 3F9FFFFH	1FC000H to 1FCFFFFH
	SA68	1	1	1	1	1	1	1	0	1	X	3FA000H to 3FAFFFFH	1FD000H to 1FDFFFFH
	SA69	1	1	1	1	1	1	1	1	0	X	3FC000H to 3FCFFFFH	1FE000H to 1FEFFFFH
	SA70	1	1	1	1	1	1	1	1	1	X	3FE000H to 3FFFFFH	1FF000H to 1FFFFFH

MB84VD2218X/2218XA/2219X/2219XA-10

Table 2.8 Sector Address Tables (MB84VD22194/A)

Bank	Sector	Sector Address										Address Range (BYTE mode)	Address Range (WORD mode)
		Bank Address											
		A ₂₀	A ₁₉	A ₁₈	A ₁₇	A ₁₆	A ₁₅	A ₁₄	A ₁₃	A ₁₂	A ₁₁		
Bank 1	SA0	0	0	0	0	0	0	0	0	0	X	000000H to 001FFFFH	000000H to 000FFFFH
	SA1	0	0	0	0	0	0	0	0	1	X	002000H to 003FFFFH	001000H to 001FFFFH
	SA2	0	0	0	0	0	0	0	1	0	X	004000H to 005FFFFH	002000H to 002FFFFH
	SA3	0	0	0	0	0	0	0	1	1	X	006000H to 007FFFFH	003000H to 003FFFFH
	SA4	0	0	0	0	0	0	1	0	0	X	008000H to 009FFFFH	004000H to 004FFFFH
	SA5	0	0	0	0	0	0	1	0	1	X	00A000H to 00BFFFFH	005000H to 005FFFFH
	SA6	0	0	0	0	0	0	1	1	0	X	00C000H to 00DFFFFH	006000H to 006FFFFH
	SA7	0	0	0	0	0	0	1	1	1	X	00E000H to 00FFFFFFH	007000H to 007FFFFH
	SA8	0	0	0	0	0	1	X	X	X	X	010000H to 01FFFFFFH	008000H to 00FFFFFFH
	SA9	0	0	0	0	1	0	X	X	X	X	020000H to 02FFFFFFH	010000H to 017FFFFH
	SA10	0	0	0	0	1	1	X	X	X	X	030000H to 03FFFFFFH	018000H to 01FFFFFFH
	SA11	0	0	0	1	0	0	X	X	X	X	040000H to 04FFFFFFH	020000H to 027FFFFH
	SA12	0	0	0	1	0	1	X	X	X	X	050000H to 05FFFFFFH	028000H to 02FFFFFFH
	SA13	0	0	0	1	1	0	X	X	X	X	060000H to 06FFFFFFH	030000H to 037FFFFH
	SA14	0	0	0	1	1	1	X	X	X	X	070000H to 07FFFFFFH	038000H to 03FFFFFFH
	SA15	0	0	1	0	0	0	X	X	X	X	080000H to 08FFFFFFH	040000H to 047FFFFH
	SA16	0	0	1	0	0	1	X	X	X	X	090000H to 09FFFFFFH	048000H to 04FFFFFFH
	SA17	0	0	1	0	1	0	X	X	X	X	0A0000H to 0AFFFFFFH	050000H to 057FFFFH
	SA18	0	0	1	0	1	1	X	X	X	X	0B0000H to 0BFFFFFFH	058000H to 05FFFFFFH
	SA19	0	0	1	1	0	0	X	X	X	X	0C0000H to 0CFFFFFFH	060000H to 067FFFFH
	SA20	0	0	1	1	0	1	X	X	X	X	0D0000H to 0DFFFFFFH	068000H to 06FFFFFFH
	SA21	0	0	1	1	1	0	X	X	X	X	0E0000H to 0EFFFFFFH	070000H to 077FFFFH
	SA22	0	0	1	1	1	1	X	X	X	X	0F0000H to 0FFFFFFH	078000H to 07FFFFFFH
	SA23	0	1	0	0	0	0	X	X	X	X	100000H to 10FFFFFFH	080000H to 087FFFFH
	SA24	0	1	0	0	0	1	X	X	X	X	110000H to 11FFFFFFH	088000H to 08FFFFFFH
	SA25	0	1	0	0	1	0	X	X	X	X	120000H to 12FFFFFFH	090000H to 097FFFFH
	SA26	0	1	0	0	1	1	X	X	X	X	130000H to 13FFFFFFH	098000H to 09FFFFFFH
	SA27	0	1	0	1	0	0	X	X	X	X	140000H to 14FFFFFFH	0A0000H to 0A7FFFFH
	SA28	0	1	0	1	0	1	X	X	X	X	150000H to 15FFFFFFH	0A8000H to 0AFFFFFFH
	SA29	0	1	0	1	1	0	X	X	X	X	160000H to 16FFFFFFH	0B0000H to 0B7FFFFH
	SA30	0	1	0	1	1	1	X	X	X	X	170000H to 17FFFFFFH	0B8000H to 0BFFFFFFH
	SA31	0	1	1	0	0	0	X	X	X	X	180000H to 18FFFFFFH	0C0000H to 0C7FFFFH
	SA32	0	1	1	0	0	1	X	X	X	X	190000H to 19FFFFFFH	0C8000H to 0CFFFFFFH
	SA33	0	1	1	0	1	0	X	X	X	X	1A0000H to 1AFFFFFFH	0D0000H to 0D7FFFFH
	SA34	0	1	1	0	1	1	X	X	X	X	1B0000H to 1BFFFFFFH	0D8000H to 0DFFFFFFH
	SA35	0	1	1	1	0	0	X	X	X	X	1C0000H to 1CFFFFFFH	0E0000H to 0E7FFFFH
SA36	0	1	1	1	0	1	X	X	X	X	1D0000H to 1DFFFFFFH	0E8000H to 0EFFFFFFH	

(Continued)

MB84VD2218X/2218XA/2219X/2219XA-10

(Continued)

Bank	Sector	Sector Address										Address Range (BYTE mode)	Address Range (WORD mode)
		Bank Address											
		A ₂₀	A ₁₉	A ₁₈	A ₁₇	A ₁₆	A ₁₅	A ₁₄	A ₁₃	A ₁₂	A ₁₁		
Bank 2	SA37	0	1	1	1	1	0	X	X	X	X	1E0000H to 1EFFFFH	0F0000H to 0F7FFFFH
	SA38	0	1	1	1	1	1	X	X	X	X	1F0000H to 1FFFFFH	0F8000H to 0FFFFFH
	SA39	1	0	0	0	0	0	X	X	X	X	200000H to 20FFFFH	100000H to 107FFFFH
	SA40	1	0	0	0	0	1	X	X	X	X	210000H to 21FFFFH	108000H to 10FFFFH
	SA41	1	0	0	0	1	0	X	X	X	X	220000H to 22FFFFH	110000H to 117FFFFH
	SA42	1	0	0	0	1	1	X	X	X	X	230000H to 23FFFFH	118000H to 11FFFFH
	SA43	1	0	0	1	0	0	X	X	X	X	240000H to 24FFFFH	120000H to 127FFFFH
	SA44	1	0	0	1	0	1	X	X	X	X	250000H to 25FFFFH	128000H to 12FFFFH
	SA45	1	0	0	1	1	0	X	X	X	X	260000H to 26FFFFH	130000H to 137FFFFH
	SA46	1	0	0	1	1	1	X	X	X	X	270000H to 27FFFFH	138000H to 13FFFFH
	SA47	1	0	1	0	0	0	X	X	X	X	280000H to 28FFFFH	140000H to 147FFFFH
	SA48	1	0	1	0	0	1	X	X	X	X	290000H to 29FFFFH	148000H to 14FFFFH
	SA49	1	0	1	0	1	0	X	X	X	X	2A0000H to 2AFFFFH	150000H to 157FFFFH
	SA50	1	0	1	0	1	1	X	X	X	X	2B0000H to 2BFFFFH	158000H to 15FFFFH
	SA51	1	0	1	1	0	0	X	X	X	X	2C0000H to 2CFFFFH	160000H to 167FFFFH
	SA52	1	0	1	1	0	1	X	X	X	X	2D0000H to 2DFFFFH	168000H to 16FFFFH
	SA53	1	0	1	1	1	0	X	X	X	X	2E0000H to 2EFFFFH	170000H to 177FFFFH
	SA54	1	0	1	1	1	1	X	X	X	X	2F0000H to 2FFFFFH	178000H to 17FFFFH
	SA55	1	1	0	0	0	0	X	X	X	X	300000H to 30FFFFH	180000H to 187FFFFH
	SA56	1	1	0	0	0	1	X	X	X	X	310000H to 31FFFFH	188000H to 18FFFFH
	SA57	1	1	0	0	1	0	X	X	X	X	320000H to 32FFFFH	190000H to 197FFFFH
	SA58	1	1	0	0	1	1	X	X	X	X	330000H to 33FFFFH	198000H to 19FFFFH
	SA59	1	1	0	1	0	0	X	X	X	X	340000H to 34FFFFH	1A0000H to 1A7FFFFH
	SA60	1	1	0	1	0	1	X	X	X	X	350000H to 35FFFFH	1A8000H to 1AFFFFH
	SA61	1	1	0	1	1	0	X	X	X	X	360000H to 36FFFFH	1B0000H to 1B7FFFFH
	SA62	1	1	0	1	1	1	X	X	X	X	370000H to 37FFFFH	1B8000H to 1BFFFFH
	SA63	1	1	1	0	0	0	X	X	X	X	380000H to 38FFFFH	1C0000H to 1C7FFFFH
	SA64	1	1	1	0	0	1	X	X	X	X	390000H to 39FFFFH	1C8000H to 1CFFFFH
	SA65	1	1	1	0	1	0	X	X	X	X	3A0000H to 3AFFFFH	1D0000H to 1D7FFFFH
	SA66	1	1	1	0	1	1	X	X	X	X	3B0000H to 3BFFFFH	1D8000H to 1DFFFFH
	SA67	1	1	1	1	0	0	X	X	X	X	3C0000H to 3CFFFFH	1E0000H to 1E7FFFFH
	SA68	1	1	1	1	0	1	X	X	X	X	3D0000H to 3DFFFFH	1E8000H to 1EFFFFH
	SA69	1	1	1	1	1	0	X	X	X	X	3E0000H to 3EFFFFH	1F0000H to 1F7FFFFH
	SA70	1	1	1	1	1	1	X	X	X	X	3F0000H to 3FFFFFH	1F8000H to 1FFFFFH

MB84VD2218X/2218XA/2219X/2219XA-10

**Table 3.1 Sector Group Addresses (MB84VD2218X/XA)
(Top Boot Block)**

Sector Group	A ₂₀	A ₁₉	A ₁₈	A ₁₇	A ₁₆	A ₁₅	A ₁₄	A ₁₃	A ₁₂	Sectors
SGA0	0	0	0	0	0	0	X	X	X	SA0
SGA1	0	0	0	0	0	1	X	X	X	SA1 to SA3
					1	0				
					1	1				
SGA2	0	0	0	1	X	X	X	X	X	SA4 to SA7
SGA3	0	0	1	0	X	X	X	X	X	SA8 to SA11
SGA4	0	0	1	1	X	X	X	X	X	SA12 to SA15
SGA5	0	1	0	0	X	X	X	X	X	SA16 to SA19
SGA6	0	1	0	1	X	X	X	X	X	SA20 to SA23
SGA7	0	1	1	0	X	X	X	X	X	SA24 to SA27
SGA8	0	1	1	1	X	X	X	X	X	SA28 to SA31
SGA9	1	0	0	0	X	X	X	X	X	SA32 to SA35
SGA10	1	0	0	1	X	X	X	X	X	SA36 to SA39
SGA11	1	0	1	0	X	X	X	X	X	SA40 to SA43
SGA12	1	0	1	1	X	X	X	X	X	SA44 to SA47
SGA13	1	1	0	0	X	X	X	X	X	SA48 to SA51
SGA14	1	1	0	1	X	X	X	X	X	SA52 to SA55
SGA15	1	1	1	0	X	X	X	X	X	SA56 to SA59
SGA16	1	1	1	1	0	0	X	X	X	SA60 to SA62
					0	1				
					1	0				
SGA17	1	1	1	1	1	1	0	0	0	SA63
SGA18	1	1	1	1	1	1	0	0	1	SA64
SGA19	1	1	1	1	1	1	0	1	0	SA65
SGA20	1	1	1	1	1	1	0	1	1	SA66
SGA21	1	1	1	1	1	1	1	0	0	SA67
SGA22	1	1	1	1	1	1	1	0	1	SA68
SGA23	1	1	1	1	1	1	1	1	0	SA69
SGA24	1	1	1	1	1	1	1	1	1	SA70

MB84VD2218X/2218XA/2219X/2219XA-10

**Table 3.2 Sector Group Addresses (MB84VD2219X/XA)
(Bottom Boot Block)**

Sector Group	A ₂₀	A ₁₉	A ₁₈	A ₁₇	A ₁₆	A ₁₅	A ₁₄	A ₁₃	A ₁₂	Sectors
SGA0	0	0	0	0	0	0	0	0	0	SA0
SGA1	0	0	0	0	0	0	0	0	1	SA1
SGA2	0	0	0	0	0	0	0	1	0	SA2
SGA3	0	0	0	0	0	0	0	1	1	SA3
SGA4	0	0	0	0	0	0	1	0	0	SA4
SGA5	0	0	0	0	0	0	1	0	1	SA5
SGA6	0	0	0	0	0	0	1	1	0	SA6
SGA7	0	0	0	0	0	0	1	1	1	SA7
SGA8	0	0	0	0	0	1	X	X	X	SA8 to SA10
					1	0				
					1	1				
SGA9	0	0	0	1	X	X	X	X	X	SA11 to SA14
SGA10	0	0	1	0	X	X	X	X	X	SA15 to SA18
SGA11	0	0	1	1	X	X	X	X	X	SA19 to SA22
SGA12	0	1	0	0	X	X	X	X	X	SA23 to SA26
SGA13	0	1	0	1	X	X	X	X	X	SA27 to SA30
SGA14	0	1	1	0	X	X	X	X	X	SA31 to SA34
SGA15	0	1	1	1	X	X	X	X	X	SA35 to SA38
SGA16	1	0	0	0	X	X	X	X	X	SA39 to SA42
SGA17	1	0	0	1	X	X	X	X	X	SA43 to SA46
SGA18	1	0	1	0	X	X	X	X	X	SA47 to SA50
SGA19	1	0	1	1	X	X	X	X	X	SA51 to SA54
SGA20	1	1	0	0	X	X	X	X	X	SA55 to SA58
SGA21	1	1	0	1	X	X	X	X	X	SA59 to SA62
SGA22	1	1	1	0	X	X	X	X	X	SA63 to SA66
SGA23	1	1	1	1	0	0	X	X	X	SA67 to SA69
					0	1				
					1	0				
SGA24	1	1	1	1	1	1	X	X	X	SA70

MB84VD2218X/2218XA/2219X/2219XA-10

Table 4 Flash Memory Autoselect Codes

Type			A ₁₂ to A ₁₉	A ₆	A ₁	A ₀	A ₋₁ *1	Code (HEX)
Manufacturer's Code			X	V _{IL}	V _{IL}	V _{IL}	V _{IL}	04H
Device Code	MB84VD22181 MB84VD22181A	Byte	X	V _{IL}	V _{IL}	V _{IH}	V _{IL}	59H
		Word					X	2259H
	MB84VD22191 MB84VD22191A	Byte	X	V _{IL}	V _{IL}	V _{IH}	V _{IL}	5AH
		Word					X	225AH
	MB84VD22182 MB84VD22182A	Byte	X	V _{IL}	V _{IL}	V _{IH}	V _{IL}	55H
		Word					X	2255H
	MB84VD22192 MB84VD22192A	Byte	X	V _{IL}	V _{IL}	V _{IH}	V _{IL}	56H
		Word					X	2256H
	MB84VD22183 MB84VD22183A	Byte	X	V _{IL}	V _{IL}	V _{IH}	V _{IL}	50H
		Word					X	2250H
	MB84VD22193 MB84VD22193A	Byte	X	V _{IL}	V _{IL}	V _{IH}	V _{IL}	53H
		Word					X	2253H
	MB84VD22184 MB84VD22184A	Byte	X	V _{IL}	V _{IL}	V _{IH}	V _{IL}	5CH
		Word					X	225CH
	MB84VD22194 MB84VD22194A	Byte	X	V _{IL}	V _{IL}	V _{IH}	V _{IL}	5FH
		Word					X	225FH
Sector Group protect			Sector Group Address	V _{IL}	V _{IH}	V _{IL}	V _{IL}	01H*2

*1: A₋₁ is for Byte mode.

*2: Output 01H at protected sector address and output 00H at unprotected sector address.

MB84VD2218X/2218XA/2219X/2219XA-10

Table 5 Flash Memory Command Definitions

Command Sequence		Bus Write Cycles Req'd	First Bus Write Cycle		Second Bus Write Cycle		Third Bus Write Cycle		Fourth Bus Read/Write Cycle		Fifth Bus Write Cycle		Sixth Bus Write Cycle	
			Addr.	Data	Addr.	Data	Addr.	Data	Addr.	Data	Addr.	Data	Addr.	Data
Read/Reset (Note 1)		1	XXXH	F0H	—	—	—	—	—	—	—	—	—	—
Read/Reset (Note 1)	Word	3	555H	AAH	2AAH	55H	555H	F0H	RA	RD	—	—	—	—
	Byte		AAAH		555H		AAAH							
Autoselect	Word	3	555H	AAH	2AAH	55H	(BA) 555H	90H	—	—	—	—	—	—
	Byte		AAAH		555H		(BA) AAAH							
Program	Word	4	555H	AAH	2AAH	55H	555H	A0H	PA	PD	—	—	—	—
	Byte		AAAH		555H		AAAH							
Chip Erase	Word	6	555H	AAH	2AAH	55H	555H	80H	555H	AAH	2AAH	55H	555H	10H
	Byte		AAAH		555H		AAAH		AAAH		555H		AAAH	
Sector Erase	Word	6	555H	AAH	2AAH	55H	555H	80H	555H	AAH	2AAH	55H	SA	30H
	Byte		AAAH		555H		AAAH		AAAH		555H			
Sector Erase Suspend		1	BA	B0H	—	—	—	—	—	—	—	—	—	—
Sector Erase Resume		1	BA	30H	—	—	—	—	—	—	—	—	—	—
Set to Fast Mode	Word	3	555H	AAH	2AAH	55H	555H	20H	—	—	—	—	—	—
	Byte		AAAH		555H		AAAH							
Fast Program (Note 2)	Word	2	XXXH	A0H	PA	PD	—	—	—	—	—	—	—	—
	Byte													
Reset from Fast Mode (Note 2)	Word	2	BA	90H	XXXH	F0H (Note6)	—	—	—	—	—	—	—	—
	Byte													
Extended Sector Group Protection (Note 3)	Word	4	XXXH	60H	SPA	60H	SPA	40H	SPA	SD	—	—	—	—
	Byte													
Query (Note 4)	Word	1	55H	98H	—	—	—	—	—	—	—	—	—	—
	Byte		AAH											
Hi-ROM Entry	Word	3	555H	AAH	2AAH	55H	555H	88H	—	—	—	—	—	—
	Byte		AAAH		555H		AAAH							
Hi-ROM Program (Note 5)	Word	4	555H	AAH	2AAH	55H	555H	A0H	PA	PD	—	—	—	—
	Byte		AAAH		555H		AAAH							
Hi-ROM Erase (Note 5)	Word	6	555H	AAH	2AAH	55H	555H	80H	555H	AAH	2AAH	55H	HRA	30H
	Byte		AAAH		555H		AAAH		AAAH		555H			
Hi-ROM Exit (Note 5)	Word	4	555H	AAH	2AAH	55H	(HRBA) 555H	90H	XXXH	00H	—	—	—	—
	Byte		AAAH		555H		(HRBA) AAAH							

MB84VD2218X/2218XA/2219X/2219XA-10

Notes: 1: Both Read/Reset commands are functionally equivalent, resetting the device to the read mode.

2: This command is valid while Fast Mode.

3: This command is valid while $\overline{\text{RESET}} = V_{\text{ID}}$.

4: The valid Address is A_0 to A_6 .

5: This command is valid while Hi-ROM mode.

6: The data "00H" is also acceptable.

Address bits A_{11} to $A_{20} = X = \text{"H" or "L"}$ for all address commands except for Program Address (PA), Sector Address (SA), and Bank Address (BA).

Bus operations are defined in Table 1 "User Bus Operations".

RA = Address of the memory location to be read.

PA = Address of the memory location to be programmed.

Addresses are latched on the falling edge of the write pulse.

SA = Address of the sector to be erased. The combination of A_{20} , A_{19} , A_{18} , A_{17} , A_{16} , A_{15} , A_{14} , A_{13} , and A_{12} will uniquely select any sector.

BA = Bank address (A_{15} to A_{20})

SPA = Sector group address to be protected. Set sector group address (SGA) and $(A_6, A_1, A_0) = (0, 1, 0)$.

HRA = Address of the Hidden-ROM area.

MB84VD2218X/XA (Top Boot Type) Word mode: 1F8000H to 1FFFFFFH

Byte mode: 3F0000H to 3FFFFFFH

MB84VD2219X/XA (Bottom Boot Type) Word mode: 000000H to 007FFFFH

Byte mode: 000000H to 00FFFFFFH

HRBA = Bank address of the Hidden-ROM area

MB84VD2218X/XA (Top Boot Type) : $A_{15} = A_{16} = A_{17} = A_{18} = A_{19} = A_{20} = 1$

MB84VD2219X/XA (Bottom Boot Type): $A_{15} = A_{16} = A_{17} = A_{18} = A_{19} = A_{20} = 0$

RD = Data read from location RA during read operation.

PD = Data to be programmed at location PA.

SD = Sector protection verify data. Output 01H at protected sector addresses and output 00H at unprotected sector addresses.

The system should generate the following address patterns;

Word mode: 555H or 2AAH to addresses A_0 to A_{10}

Byte mode : AAH or 55H to addresses A_{-1} and A_0 to A_{10}

MB84VD2218X/2218XA/2219X/2219XA-10

■ ABSOLUTE MAXIMUM RATINGS

Parameter	Symbol	Conditions	Rating		Unit
			Min.	Max.	
Storage Temperature	T _{stg}	—	−55	+125	°C
Ambient Temperature with Power Applied	T _A	—	−25	+85	°C
Voltage with Respect to Ground All pins (Note 1)	V _{IN} , V _{OUT}	—	−0.3	V _{CCf} +0.4	V
			−0.3	V _{CCS} +0.4	
V _{CCf} /V _{CCS} Supply (Note 1)	V _{CC}	—	−0.3	+4.0	V
$\overline{\text{RESET}}$ (Note 2)	V _{IN}	—	−0.5	+13.0	V
$\overline{\text{WP/ACC}}$ (Note 3)	V _{IN}	—	−0.5	+10.5	V

- Notes: 1. Minimum DC voltage on input or I/O pins are −0.3 V. During voltage transitions, inputs may negative overshoot V_{SS} to −2.0 V for periods of up to 20 ns. Maximum DC voltage on output and I/O pins are V_{CC} +0.4 V. During voltage transitions, outputs may positive overshoot to V_{CC} +2.0 V for periods of up to 20 ns.
2. Minimum DC input voltage on $\overline{\text{RESET}}$ pin is −0.5 V. During voltage transitions, $\overline{\text{RESET}}$ pin may negative overshoot V_{SS} to −2.0 V for periods of up to 20 ns. Maximum DC input voltage on $\overline{\text{RESET}}$ pin is +13.0 V which may positive overshoot to 14.0 V for periods of up to 20 ns. when V_{CC} is applied.
3. Minimum DC input voltage on $\overline{\text{WP/ACC}}$ pin is −0.5 V. During voltage transitions, $\overline{\text{WP/ACC}}$ pin may negative overshoot V_{SS} to −2.0V for periods of up to 20ns. Maximum DC input voltage on $\overline{\text{WP/ACC}}$ pin is +10.5 V which may positive overshoot to 10.5V for periods of up to 20ns. When V_{CC} is applied.

WARNING: Semiconductor devices can be permanently damaged by application of stress (voltage, current, temperature, etc.) in excess of absolute maximum ratings. Do not exceed these ratings.

■ RECOMMENDED OPERATING CONDITIONS

Commercial Devices

Parameter	Symbol	Conditions	Value			Unit
			Min.	Typ.	Max.	
Ambient Temperature	T _A	—	−25	—	+85	°C
V _{CCf} /V _{CCS} Supply Voltages	V _{CC}	—	+2.7	—	+3.6	V

Operating ranges define those limits between which the functionality of the device is guaranteed.

WARNING: The recommended operating conditions are required in order to ensure the normal operation of the semiconductor device. All of the device's electrical characteristics are warranted when the device is operated within these ranges.

Always use semiconductor devices within their recommended operating condition ranges. Operation outside these ranges may adversely affect reliability and could result in device failure.

No warranty is made with respect to uses, operating conditions, or combinations not represented on the data sheet. Users considering application outside the listed conditions are advised to contact their FUJITSU representatives beforehand.

MB84VD2218X/2218XA/2219X/2219XA-10

■ ELECTRICAL CHARACTERISTICS

1. DC Characteristics

Parameter Symbol	Parameter Description	Test Conditions			Min.	Typ.	Max.	Unit
I _{LI}	Input Leakage Current	V _{IN} = V _{SS} to V _{CC}			−1.0	—	+1.0	μA
I _{LO}	Output Leakage Current	V _{OUT} = V _{SS} to V _{CC}			−1.0	—	+1.0	μA
I _{LIT}	$\overline{\text{RESET}}$ Inputs Leakage Current	V _{CC} = V _{CC} Max, $\overline{\text{RESET}}$ = 12.5V			—	—	35	μA
I _{LIA}	ACC Input Leakage Current	V _{CC} = V _{CC} Max, $\overline{\text{WP/Acc}}$ = V _{ACC} Max			—	—	20	mA
I _{CC1f}	Flash V _{CC} Active Current (Read) (Note 1)	$\overline{\text{CEf}}$ = V _{IL} , $\overline{\text{OE}}$ = V _{IH}	t _{CYCLE} = 5 MHz	Byte	—	—	16	mA
			t _{CYCLE} = 5 MHz	Word	—	—	18	
			t _{CYCLE} = 1 MHz	Byte	—	—	7	mA
			t _{CYCLE} = 1 MHz	Word	—	—	7	
I _{CC2f}	Flash V _{CC} Active Current (Program/Erase)(Note 2)	$\overline{\text{CEf}}$ = V _{IL} , $\overline{\text{OE}}$ = V _{IH}			—	—	35	mA
I _{CC3f}	Flash V _{CC} Active Current (Read-While-Program) (Note 5)	$\overline{\text{CEf}}$ = V _{IL} , $\overline{\text{OE}}$ = V _{IH}	Byte		—	—	51	mA
			Word		—	—	53	
I _{CC4f}	Flash V _{CC} Active Current (Read-While-Erase) (Note 5)	$\overline{\text{CEf}}$ = V _{IL} , $\overline{\text{OE}}$ = V _{IH}	Byte		—	—	51	mA
			Word		—	—	53	
I _{CC5f}	Flash V _{CC} Active Current (Erase-Suspend-Program)	$\overline{\text{CEf}}$ = V _{IL} , $\overline{\text{OE}}$ = V _{IH}			—	—	35	mA
I _{CC1S}	SRAM V _{CC} Active Current	V _{CCS} = V _{CC} Max., $\overline{\text{CE1s}}$ = V _{IL} , $\overline{\text{CE2s}}$ = V _{IH}	t _{CYCLE} =10 MHz		—	—	40	mA
I _{CC2S}	SRAM V _{CC} Active Current	$\overline{\text{CE1s}}$ = 0.2 V, $\overline{\text{CE2s}}$ = V _{CCS} − 0.2 V	t _{CYCLE} = 10 MHz		—	—	40	mA
			t _{CYCLE} = 1 MHz		—	—	8	mA
I _{SB1f}	Flash V _{CC} Standby Current	V _{CCf} = V _{CC} Max., $\overline{\text{CEf}}$ = V _{CCf} ± 0.3 V $\overline{\text{RESET}}$ = V _{CCf} ± 0.3 V, $\overline{\text{WP/Acc}}$ = V _{CCf} ± 0.3 V			—	1	5	μA
I _{SB2f}	Flash V _{CC} Standby Current ($\overline{\text{RESET}}$)	V _{CCf} = V _{CC} Max., $\overline{\text{RESET}}$ = V _{SS} ± 0.3 V, $\overline{\text{WP/Acc}}$ = V _{CCf} ± 0.3 V			—	1	5	μA
I _{SB3f}	Flash V _{CC} Current (Auto-Sleep Mode) (Note 3)	V _{CCf} = V _{CC} Max., $\overline{\text{CEf}}$ = V _{SS} ± 0.3 V $\overline{\text{RESET}}$ = V _{CCf} ± 0.3 V, $\overline{\text{WP/Acc}}$ = V _{CCf} ± 0.3 V V _{IN} = V _{CCf} ± 0.3 V or V _{SS} ± 0.3 V			—	1	5	μA
I _{SB} S	SRAM V _{CC} Standby Current	1) $\overline{\text{CE1s}}$ = V _{IH} , $\overline{\text{CE2s}}$ = V _{IH} 2) $\overline{\text{CE2s}}$ =V _{IL}			—	—	0.6	mA
I _{SB1S}	SRAM V _{CC} Standby Current	$\overline{\text{CE1s}}$ ≥ V _{CCS} − 0.2V, $\overline{\text{CE2s}}$ ≥ V _{CCS} − 0.2V			—	0.2	7	μA
I _{SB2S}	SRAM V _{CC} Standby Current	$\overline{\text{CE2s}}$ ≤ 0.2V			—	0.2	7	μA

(Continued)

MB84VD2218X/2218XA/2219X/2219XA-10

(Continued)

Parameter Symbol	Parameter Description	Test Conditions	Min.	Typ.	Max.	Unit
V_{IL}	Input Low Level	—	−0.3	—	0.5	V
V_{IH}	Input High Level	—	2.4	—	$V_{CC}+0.3^*$	V
V_{ID}	Voltage for Sector Protection, and Temporary Sector Unprotection ($\overline{RESET}$) (Note 4)	—	11.5	—	12.5	V
V_{ACC}	Voltage for Program Acceleration ($\overline{WP}/ACC$) (Note4)	—	8.5	9.0	9.5	V
V_{OL}	Output Low Voltage Level	$V_{CCF} = V_{CCS} = V_{CC} \text{ Min.}, I_{OL}=1.0\text{mA}$	—	—	0.4	V
V_{OH}	Output High Voltage Level	$V_{CCF} = V_{CCS} = V_{CC} \text{ Min.}, I_{OH}=-0.5\text{mA}$	2.4	—	—	V
V_{LKO}	Flash Low V_{CC} Lock-Out Voltage	—	2.3	—	2.5	V

- Notes: 1. The I_{CC} current listed includes both the DC operating current and the frequency dependent component.
 2. I_{CC} active while Embedded Algorithm (program or erase) is in progress.
 3. Automatic sleep mode enables the low power mode when address remain stable for 150ns.
 4. Applicable for only V_{CC} applying.
 5. Embedded Alogorithm (program or erase) is in progress. (@5MHz)

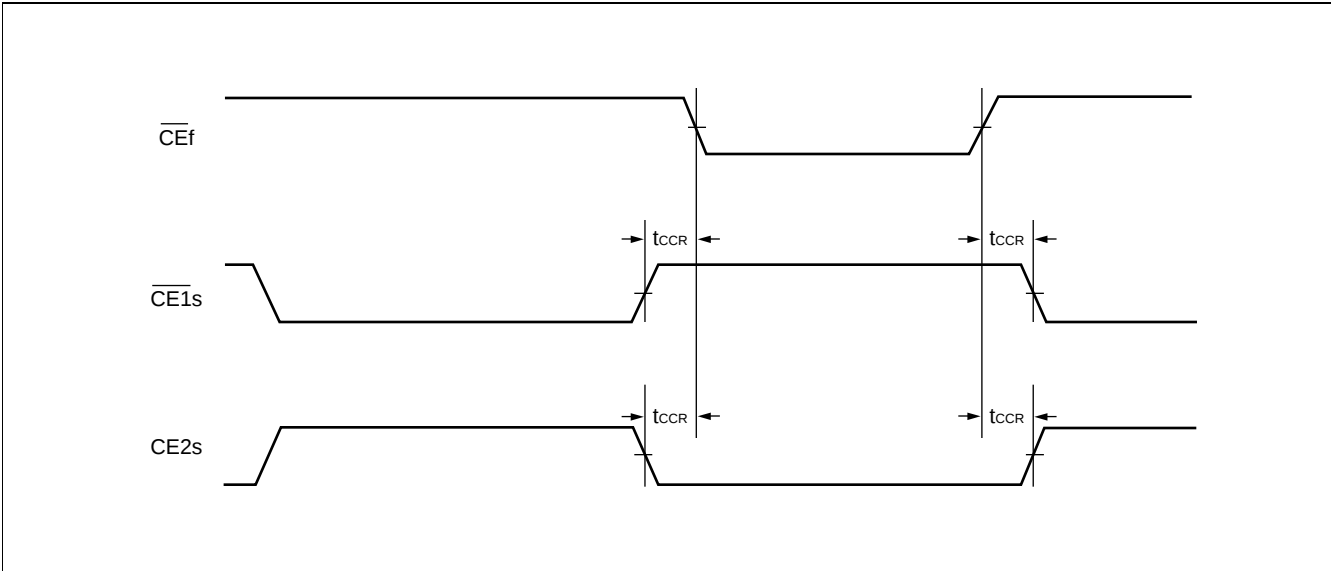
MB84VD2218X/2218XA/2219X/2219XA-10

2. AC Characteristics

• $\overline{\text{CE}}$ Timing

Parameter Symbols		Description	Test Setup		-10	Unit
JEDEC	Standard					
—	t_{CCR}	$\overline{\text{CE}}$ Recover Time	—	Min.	0	ns

• Timing Diagram for alternating SRAM to Flash



MB84VD2218X/2218XA/2219X/2219XA-10

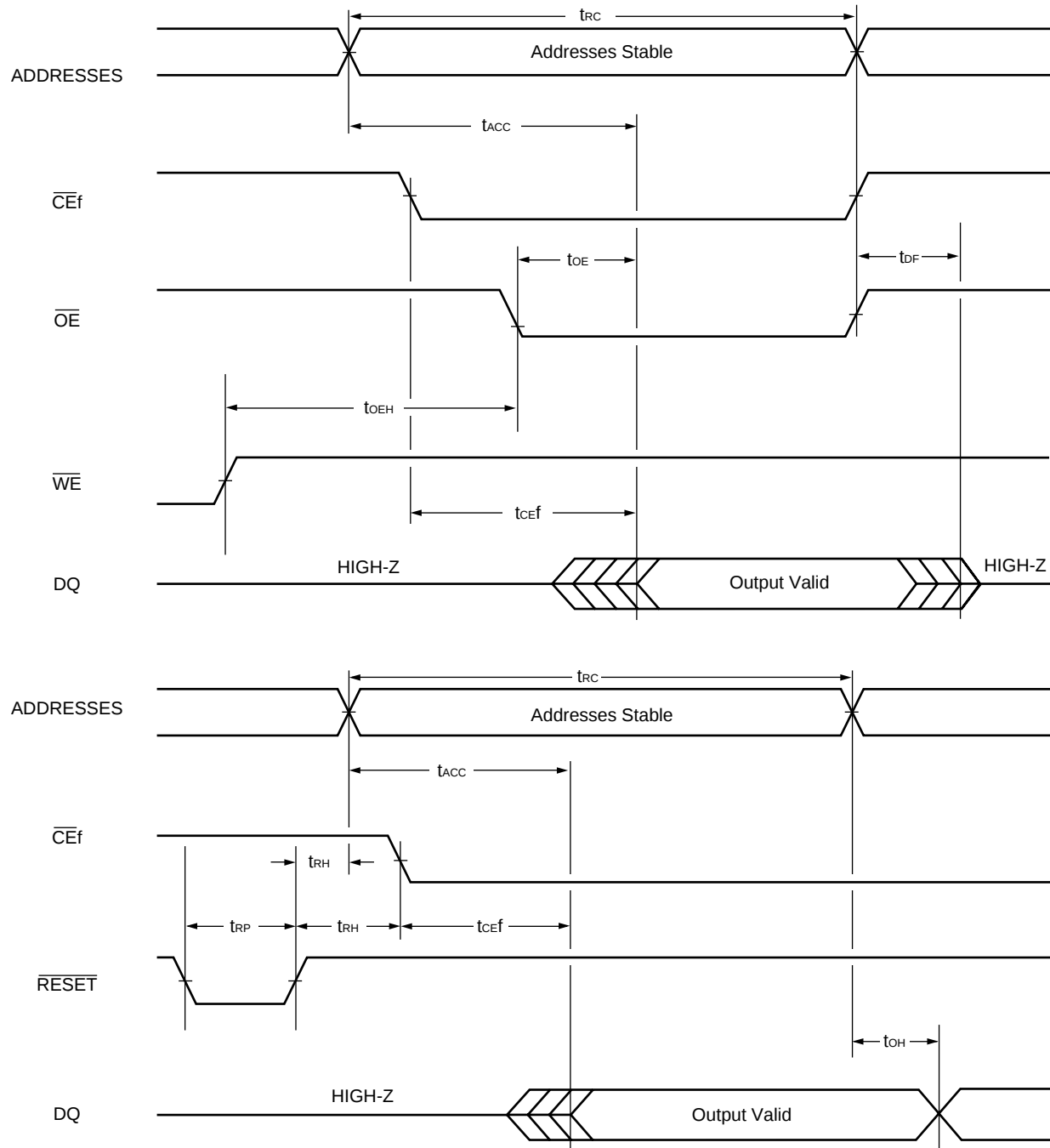
• Read Only Operations Characteristics (Flash)

Parameter Symbols		Description	Test Setup	-10 (Note)		Unit
JEDEC	Standard			Min.	Max.	
t_{AVAV}	t_{RC}	Read Cycle Time	—	100	—	ns
t_{AVQV}	t_{ACC}	Address to Output Delay	$\overline{CE}f = V_{IL}$ $\overline{OE} = V_{IL}$	—	100	ns
t_{ELQV}	t_{CEf}	Chip Enable to Output Delay	$\overline{OE} = V_{IL}$	—	100	ns
t_{GLQV}	t_{OE}	Output Enable to Output Delay	—	—	40	ns
t_{EHQZ}	t_{DF}	Chip Enable to Output High-Z	—	—	30	ns
t_{GHQZ}	t_{DF}	Output Enable to Output High-Z	—	—	30	ns
t_{AXQX}	t_{OH}	Output Hold Time From Addresses, $\overline{CE}f$ or $\overline{OE}$, Whichever Occurs First	—	0	—	ns
—	t_{READY}	$\overline{RESET}$ Pin Low to Read Mode	—	—	20	μs

Note: Test Conditions— Output Load: 1 TTL gate and 30 pF
 Input rise and fall times: 5 ns
 Input pulse levels: 0.0 V to 3.0 V
 Timing measurement reference level
 Input: 1.5 V
 Output: 1.5 V

MB84VD2218X/2218XA/2219X/2219XA-10

• Read Cycle (Flash)



MB84VD2218X/2218XA/2219X/2219XA-10

• Erase/Program Operations (Flash)

Parameter Symbols		Description	-10			Unit
JEDEC	Standard		Min.	Typ.	Max.	
t _{AVAV}	t _{WC}	Write Cycle Time	100	—	—	ns
t _{AVWL}	t _{AS}	Address Setup Time ($\overline{WE}$ to Addr.)	0	—	—	ns
—	t _{ASO}	Address Setup Time to $\overline{CE}$ Low During Toggle Bit Polling	15	—	—	ns
t _{WLAX}	t _{AH}	Address Hold Time ($\overline{WE}$ to Addr.)	50	—	—	ns
—	t _{AHT}	Address Hold Time from $\overline{CE}$ or $\overline{OE}$ High During Toggle Bit Polling	0	—	—	ns
t _{DVWH}	t _{DS}	Data Setup Time	50	—	—	ns
t _{WDHX}	t _{DH}	Data Hold Time	0	—	—	ns
—	t _{OEHL}	Output Enable Hold Time	Read	0	—	ns
			Toggle and $\overline{Data}$ Polling	10	—	ns
—	t _{CEPH}	$\overline{CE}$ High During Toggle Bit Polling	20	—	—	ns
—	t _{OEHL}	$\overline{OE}$ High During Toggle Bit Polling	20	—	—	ns
t _{GHEL}	t _{GHEL}	Read Recover Time Before Write ($\overline{OE}$ to $\overline{CEf}$)	0	—	—	ns
t _{GHWL}	t _{GHWL}	Read Recover Time Before Write ($\overline{OE}$ to $\overline{WE}$)	0	—	—	ns
t _{WLEL}	t _{WS}	$\overline{WE}$ Setup Time ($\overline{CEf}$ to $\overline{WE}$)	0	—	—	ns
t _{ELWL}	t _{CS}	$\overline{CEf}$ Setup Time ($\overline{WE}$ to $\overline{CEf}$)	0	—	—	ns
t _{EHWH}	t _{WH}	$\overline{WE}$ Hold Time ($\overline{CEf}$ to $\overline{WE}$)	0	—	—	ns
t _{WHEH}	t _{CH}	$\overline{CEf}$ Hold Time ($\overline{WE}$ to $\overline{CEf}$)	0	—	—	ns
t _{WLWH}	t _{WP}	Write Pulse Width	45	—	—	ns
t _{ELEH}	t _{CP}	$\overline{CEf}$ Pulse Width	45	—	—	ns
t _{WHWL}	t _{WPH}	Write Pulse Width High	30	—	—	ns
t _{EHEL}	t _{CPH}	$\overline{CEf}$ Pulse Width High	30	—	—	ns
t _{WHWH1}	t _{WHWH1}	Byte Programming Operation	—	8	—	μs
		Word Programming Operation	—	16	—	μs
t _{WHWH2}	t _{WHWH2}	Sector Erase Operation (Note 1)	—	1	—	sec

(Continued)

MB84VD2218X/2218XA/2219X/2219XA-10

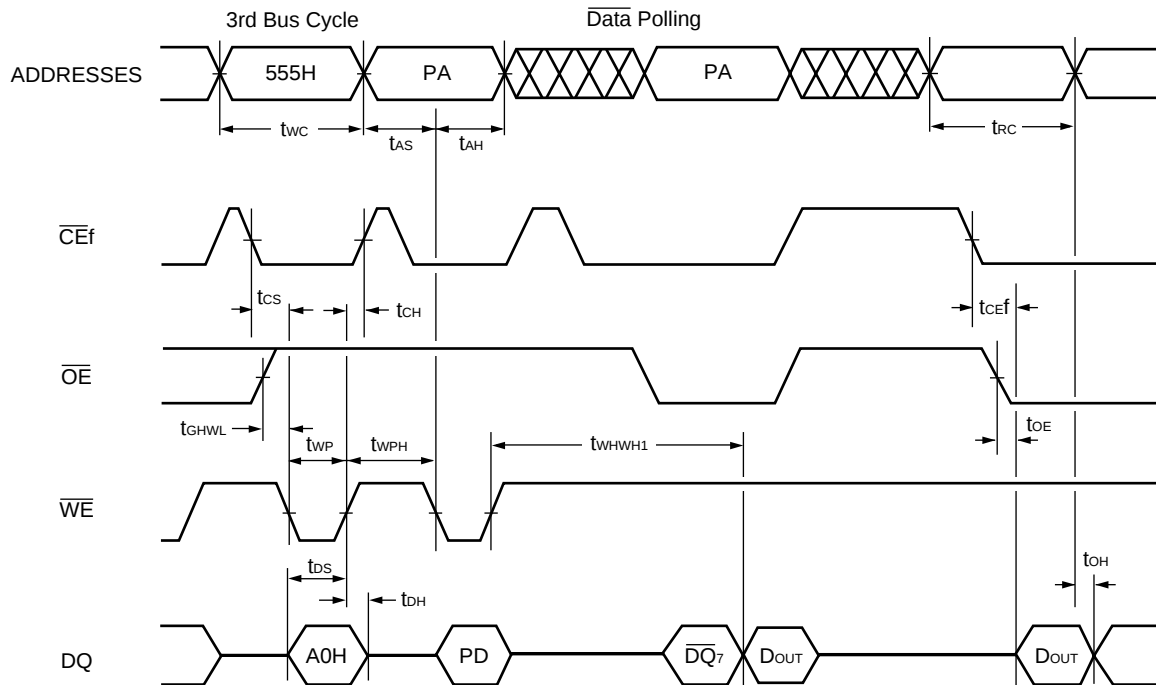
(Continued)

Parameter Symbols		Description	-10			Unit
JEDEC	Standard		Min.	Typ.	Max.	
—	t _{VCS}	V _{CCf} Setup Time	50	—	—	μs
—	t _{VLHT}	Voltage Transition Time (Note 2)	4	—	—	μs
—	t _{VIDR}	Rise Time to V _{ID} (Note 2)	500	—	—	ns
—	t _{VACCR}	Rise Time to V _{ACC}	500	—	—	ns
—	t _{RB}	Recover Time from RY/ $\overline{\text{BY}}$	0	—	—	ns
—	t _{RP}	$\overline{\text{RESET}}$ Pulse Width	500	—	—	ns
—	t _{EOE}	Delay Time from Embedded Output Enable	—	—	100	ns
—	t _{RH}	$\overline{\text{RESET}}$ High Level Period Before Read	200	—	—	ns
—	t _{BUSY}	Program/Erase Valid to RY/ $\overline{\text{BY}}$ Delay	—	—	100	ns
—	t _{TOW}	Erase Time-out Time (Note 3)	50	—	—	μs
—	t _{SPD}	Erase Suspend Transition Time (Note 4)	—	—	20	μs

- Notes: 1. This does not include the preprogramming time.
 2. This timing is for Sector Protection Operation.
 3. The time between writes must be less than "t_{TOW}" otherwise that command will not be accepted and erasure will start. A time-out or "t_{TOW}" from the rising edge of last $\overline{\text{CE}}$ or $\overline{\text{WE}}$ whichever happens first will initiate the execution of the Sector Erase command(s).
 4. When the Erase Suspend command is written during the Sector Erase operation, the device will take a maximum of "t_{SPD}" to suspend the erase operation.

MB84VD2218X/2218XA/2219X/2219XA-10

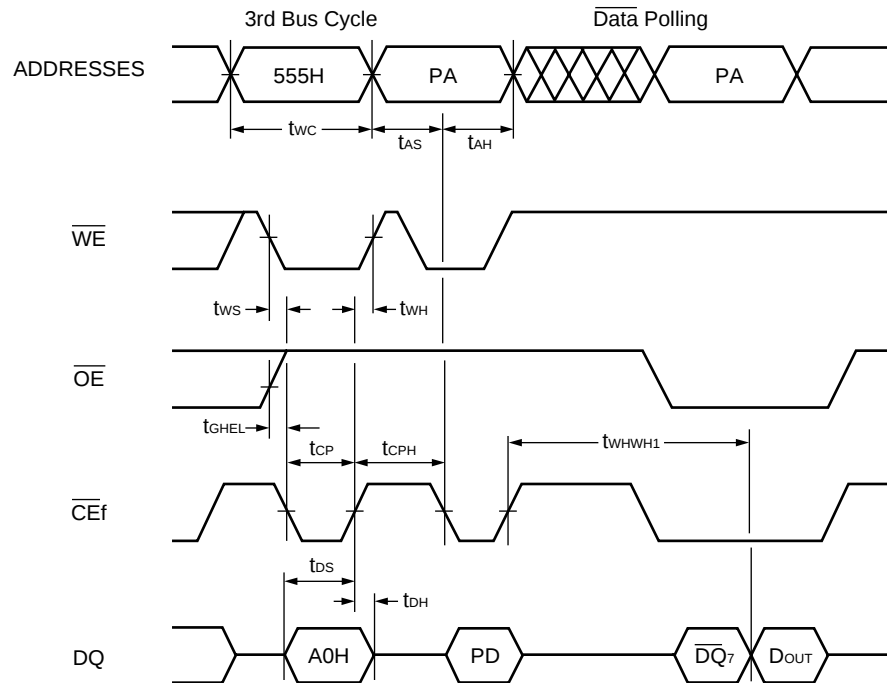
• Write Cycle ($\overline{WE}$ control) (Flash)



- Notes:
1. PA is address of the memory location to be programmed.
 2. PD is data to be programmed at byte address.
 3. $\overline{DQ}_7$ is the output of the complement of the data written to the device.
 4. D_{OUT} is the output of the data written to the device.
 5. Figure indicates last two bus cycles out of four bus cycle sequence.
 6. These waveforms are for the $\times 16$ mode. (The addresses differ from $\times 8$ mode.)

MB84VD2218X/2218XA/2219X/2219XA-10

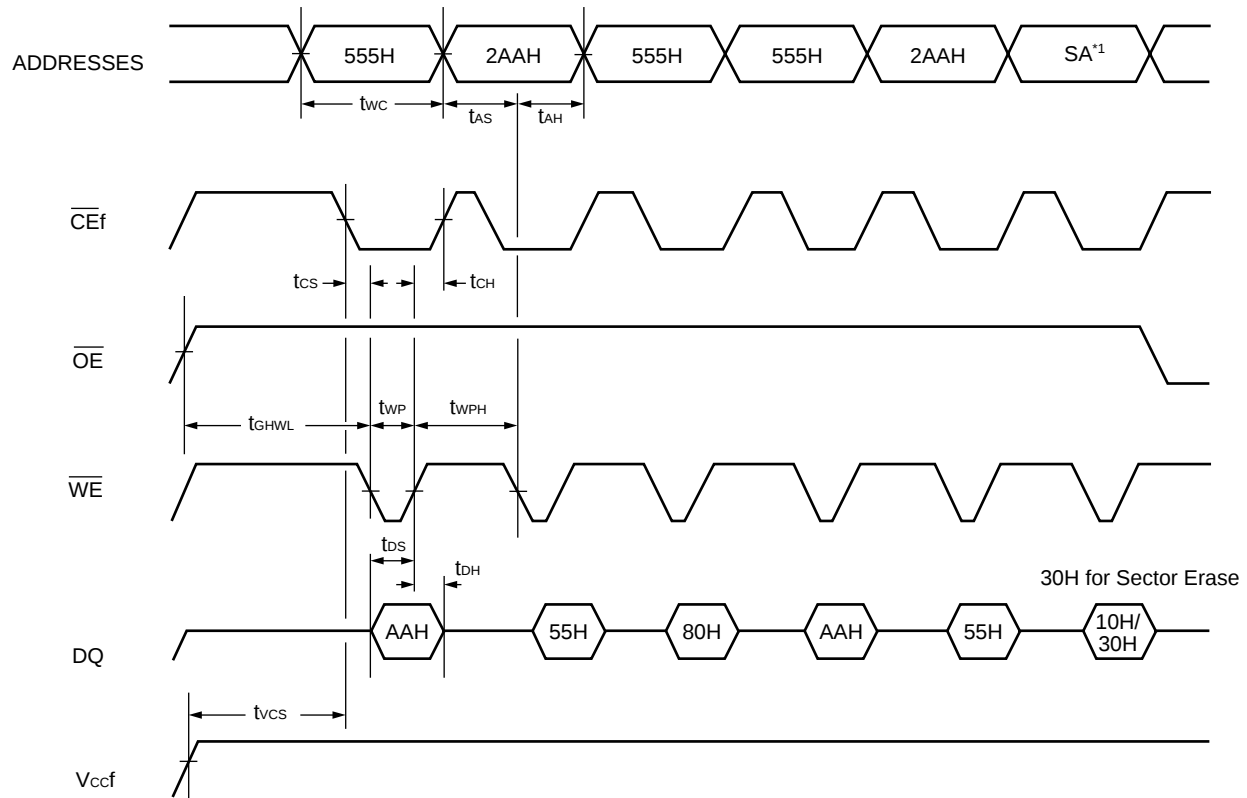
• Write Cycle ($\overline{\text{CEf}}$ control) (Flash)



- Notes:
1. PA is address of the memory location to be programmed.
 2. PD is data to be programmed at byte address.
 3. $\overline{\text{DQ}}_7$ is the output of the complement of the data written to the device.
 4. D_{OUT} is the output of the data written to the device.
 5. Figure indicates last two bus cycles out of four bus cycle sequence.
 6. These waveforms are for the $\times 16$ mode. (The addresses differ from $\times 8$ mode.)

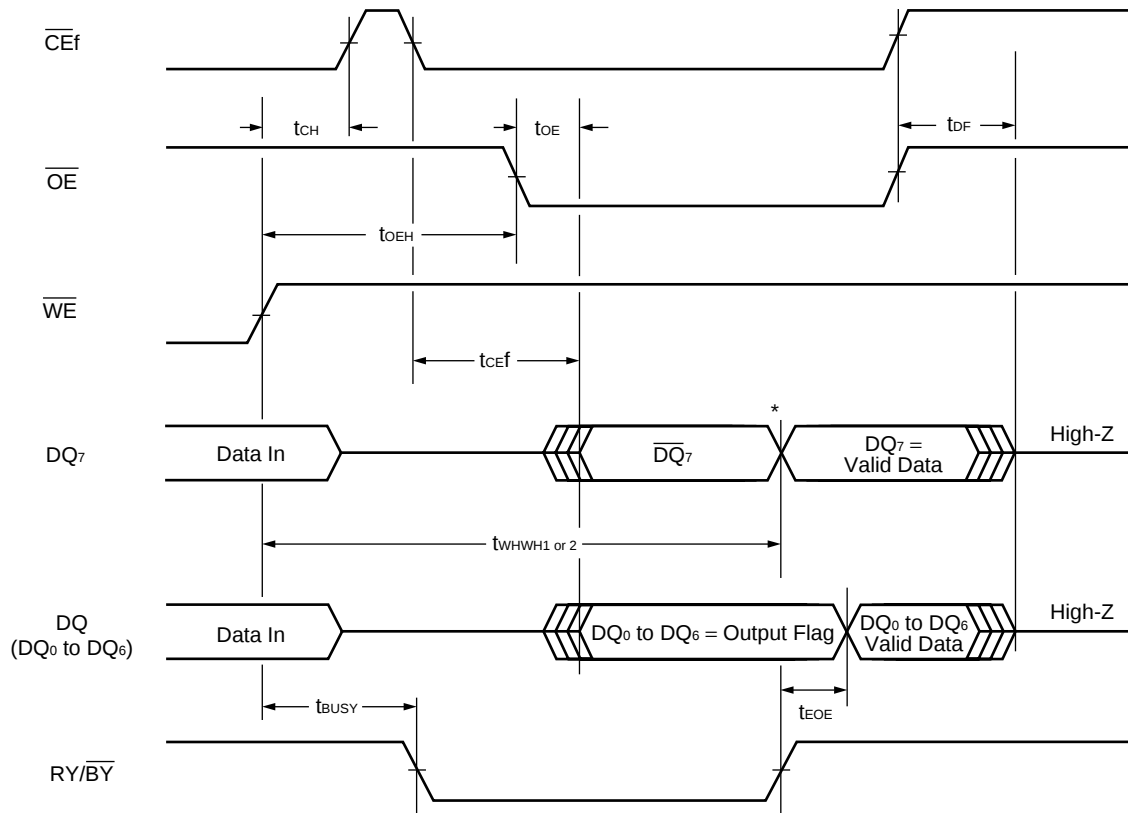
MB84VD2218X/2218XA/2219X/2219XA-10

• AC Waveforms Chip/Sector Erase Operations (Flash)



MB84VD2218X/2218XA/2219X/2219XA-10

• AC Waveforms for Data Polling during Embedded Algorithm Operations (Flash)



The timing diagram illustrates the sequence of signals for the AD9080. The signals and their timing parameters are as follows:

- Address:** Shows three valid address pulses. Timing parameters include t_{AHT} (Address Hold Time) and t_{ASO} (Address Setup Time) for the first pulse, and t_{AHT} and t_{AS} (Address Setup Time) for the second pulse.
- $\overline{CEf}$ (Chip Enable):** Shows two pulses. Timing parameters include t_{CEPH} (Chip Enable Pulse Width).
- $\overline{WE}$ (Write Enable):** Shows a single pulse. Timing parameter is t_{OEPH} (Write Enable Pulse Width).
- $\overline{OE}$ (Output Enable):** Shows multiple pulses. Timing parameter is t_{OEH} (Output Enable Hold Time).
- DQ_6/DQ_2 (Data Bus):** Shows the data sequence: Data, Toggle Data, Toggle Data, Toggle Data, Stop Toggling, and Output Valid. Timing parameters include t_{DH} (Data Hold Time), t_{OE} (Output Enable Delay), and t_{CEf^*} (Chip Enable Delay).
- $\overline{RY/BY}$ (Read/Write Busy):** Shows a pulse. Timing parameter is t_{BUSY} (Busy Time).

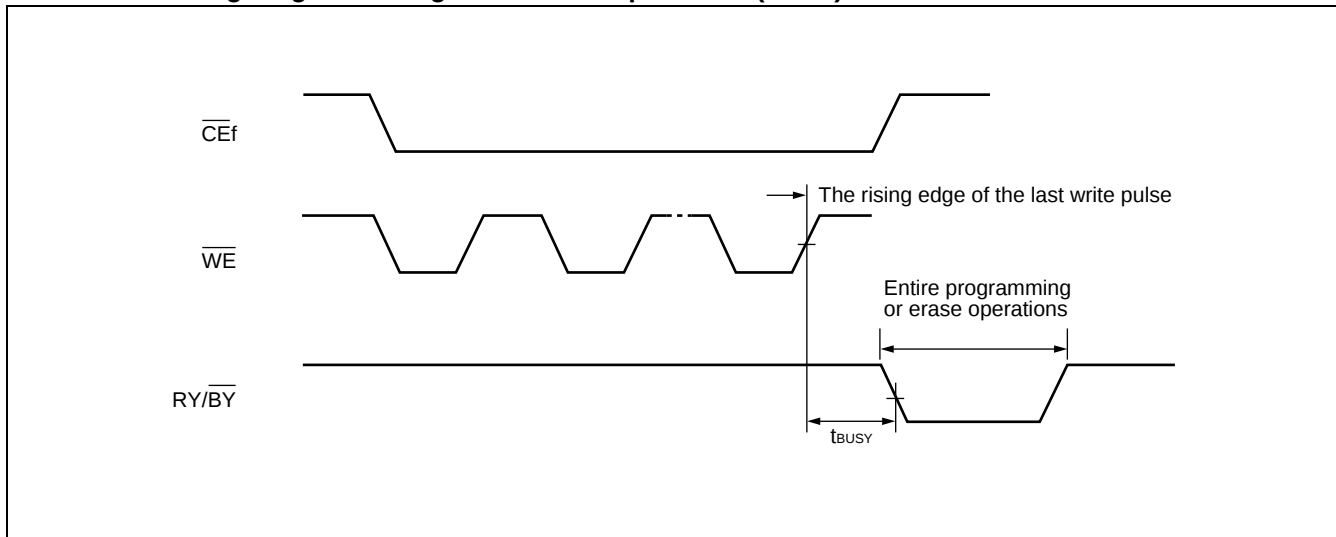
44

The diagram illustrates the timing relationships for the 72V0200 device across six cycles. The first four cycles are Read operations, and the last two are Command operations. The Address bus shows transitions between Bank A1 (BA1) and Bank A2 (555H or PA). The CEF signal is active-low, with specific timing parameters defined for its setup and hold times relative to the Address and DQ signals. The OE signal is active-low and is shown during the Read cycles. The WE signal is active-low and is shown during the Command cycles. The DQ bus shows the data being read or written, with specific timing parameters defined for its setup and hold times relative to the Address and CEF signals. The DQ states are labeled as Valid Output, Valid Input, and Status.

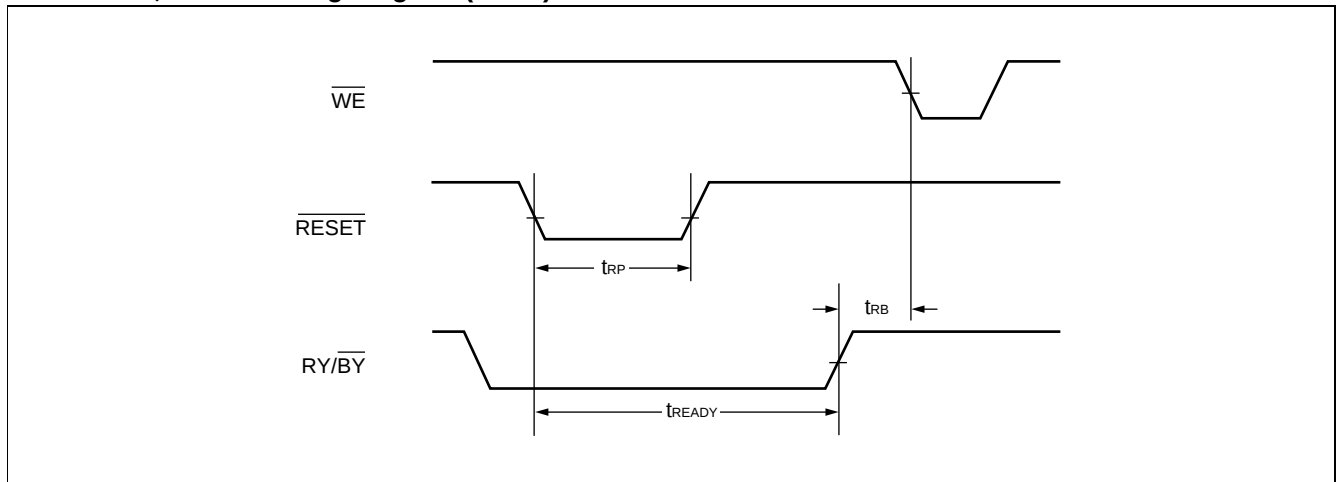
45

MB84VD2218X/2218XA/2219X/2219XA-10

• $\overline{\text{RY}}/\overline{\text{BY}}$ Timing Diagram during Write/Erase Operations (Flash)

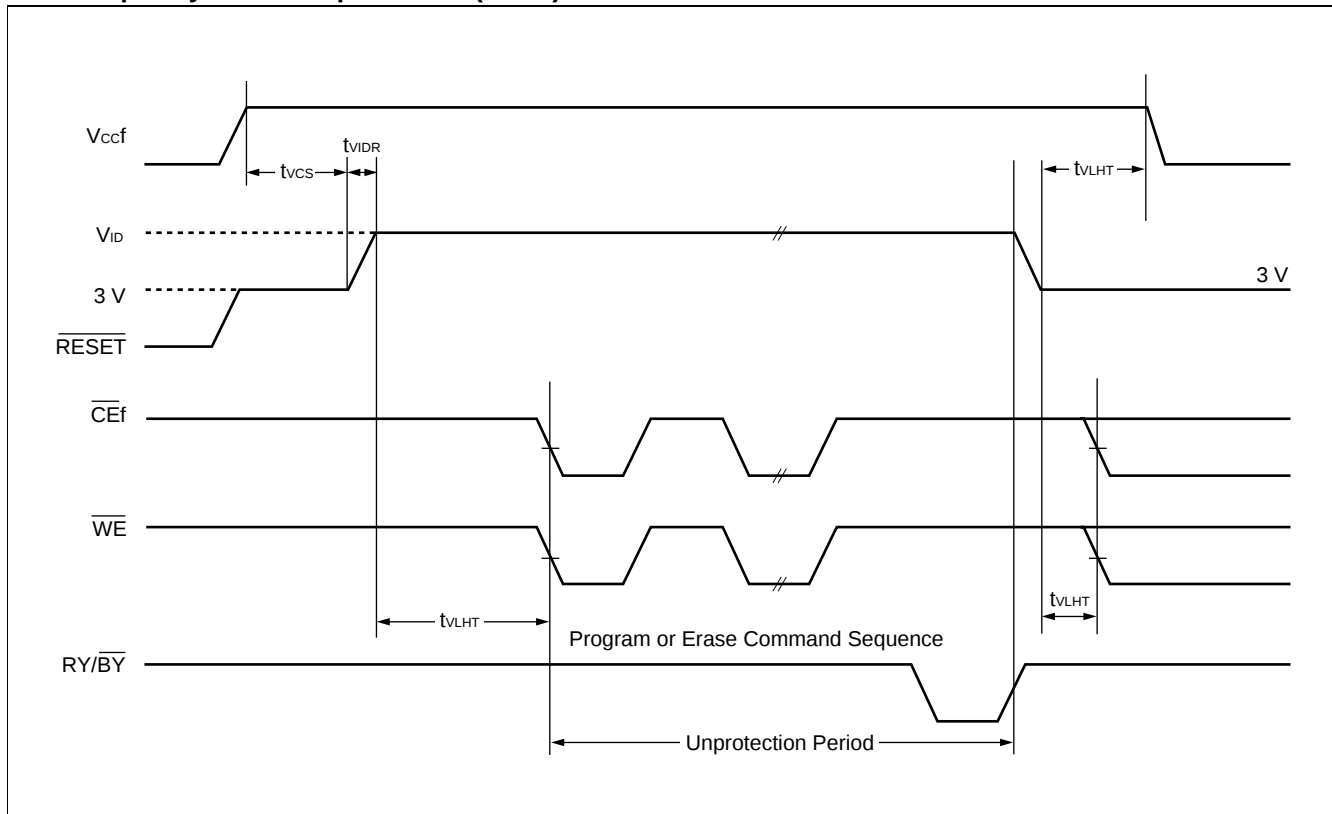


• $\overline{\text{RESET}}$, $\overline{\text{RY}}/\overline{\text{BY}}$ Timing Diagram (Flash)



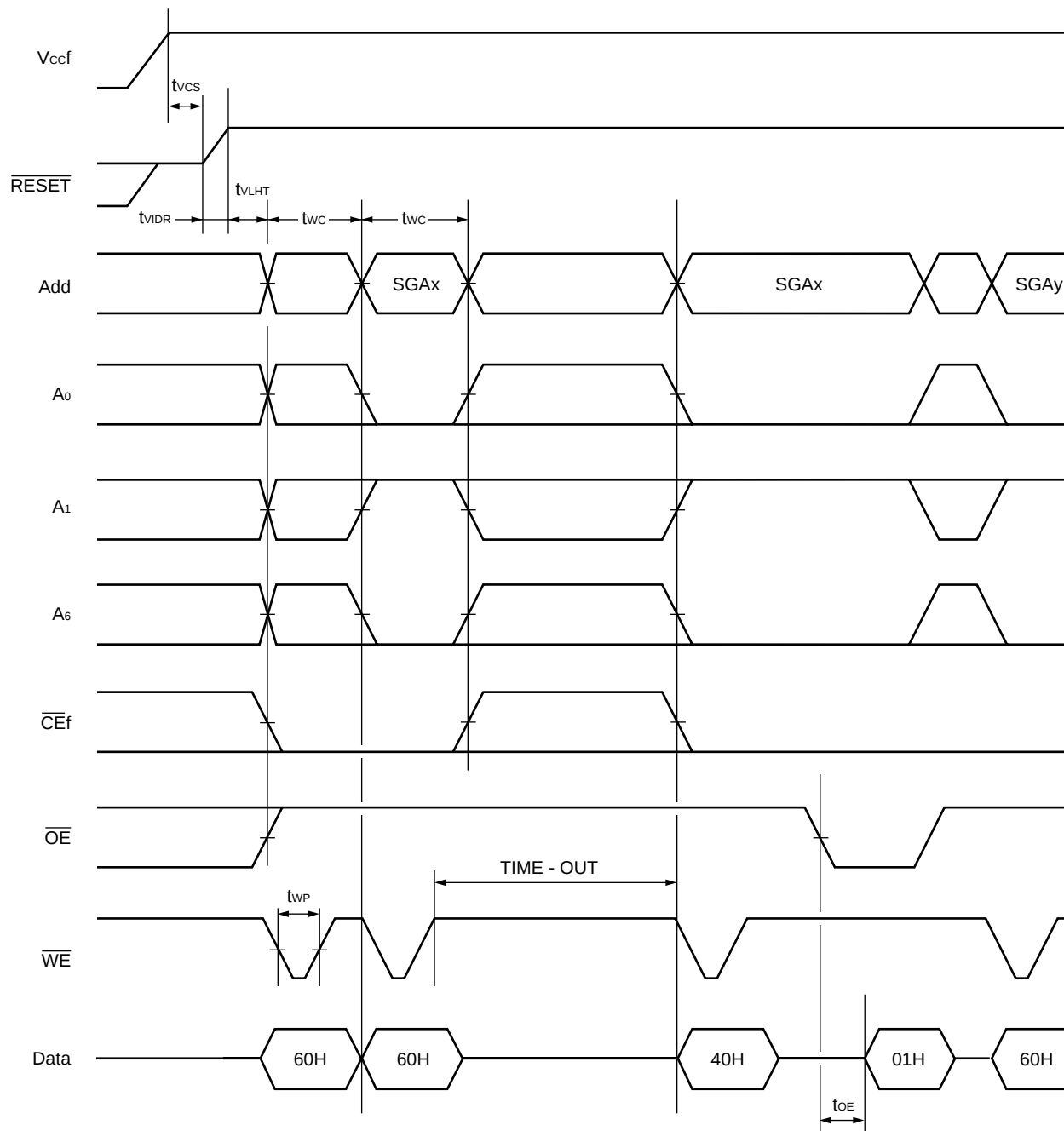
MB84VD2218X/2218XA/2219X/2219XA-10

• Temporary Sector Unprotection (Flash)



MB84VD2218X/2218XA/2219X/2219XA-10

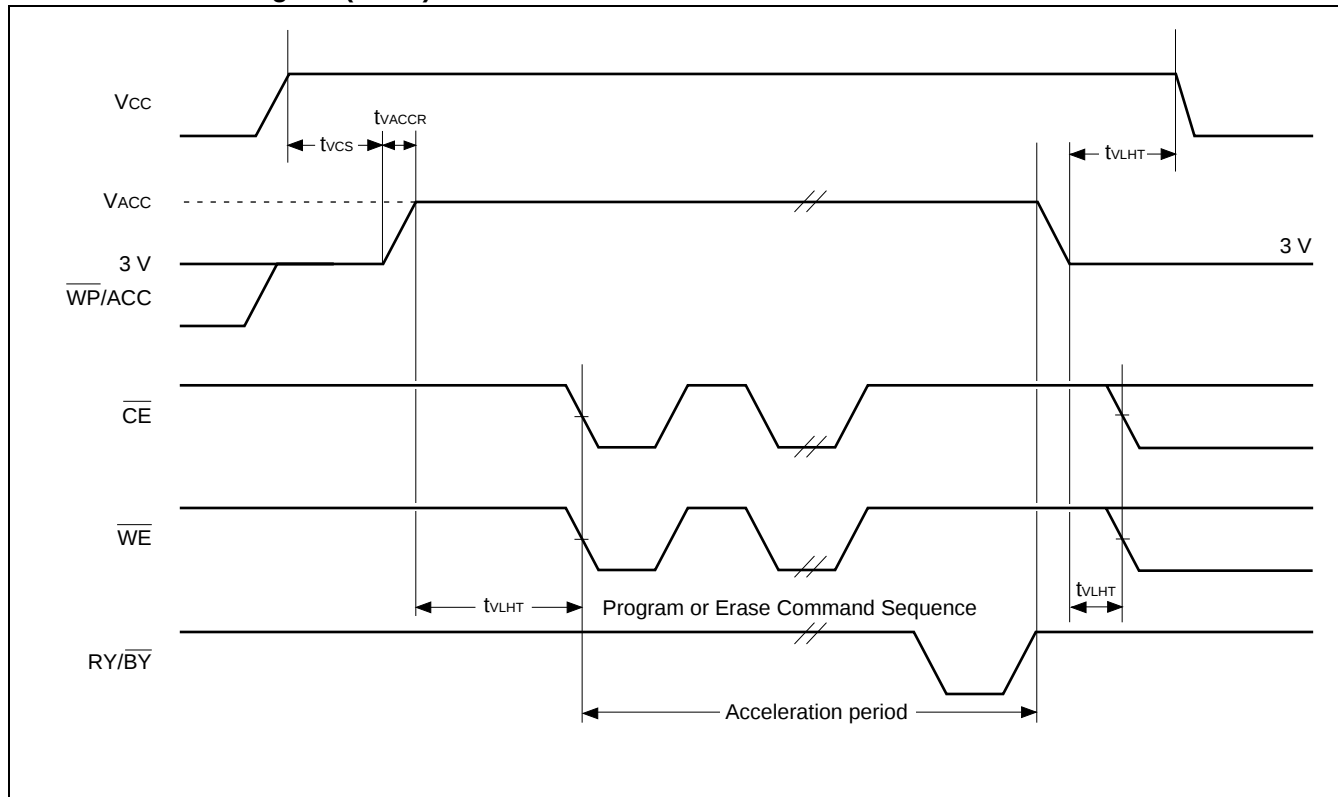
• Extended Sector Protection (Flash)



SGAx : Sector Group Address to be protected
 SGAY : Next Group Sector Address to be protected
 TIME-OUT : Time-Out window = 250 μ s (min)

MB84VD2218X/2218XA/2219X/2219XA-10

• Accelerated Program (Flash)

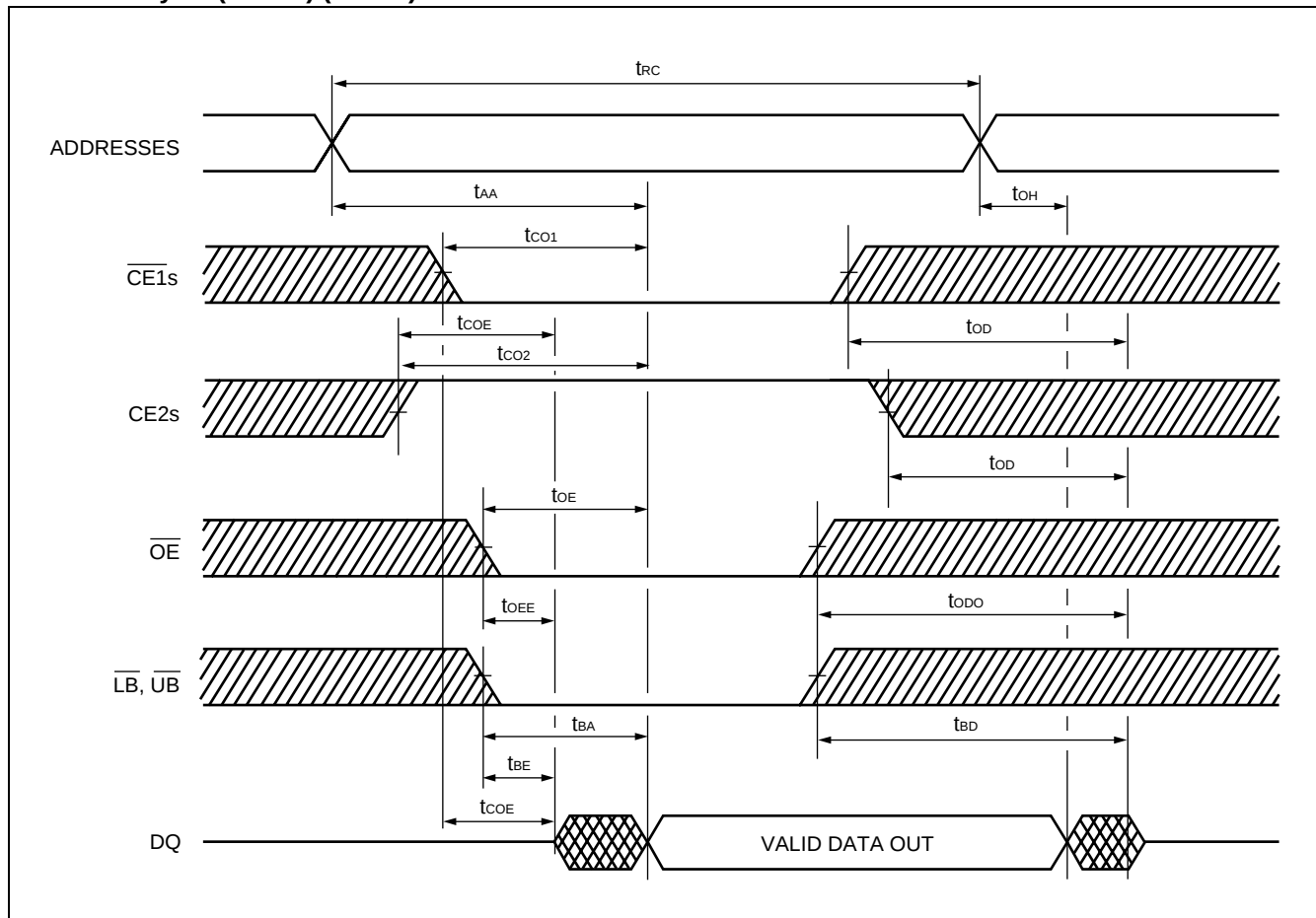


MB84VD2218X/2218XA/2219X/2219XA-10

• Read Cycle (SRAM)

Parameter Symbol	Parameter Description	Min.	Max.	Unit
t_{RC}	Read Cycle Time	85	—	ns
t_{AA}	Address Access Time	—	85	ns
t_{CO1}	Chip Enable ($\overline{CE1s}$) Access Time	—	85	ns
t_{CO2}	Chip Enable (CE2s) Access Time	—	85	ns
t_{OE}	Output Enable Access Time	—	45	ns
t_{BA}	$\overline{LB}$, $\overline{UB}$ to Output Valid	—	85	ns
t_{COE}	Chip Enable ($\overline{CE1s}$ Low and CE2s High) to Output Active	5	—	ns
t_{OEE}	Output Enable Low to Output Active	0	—	ns
t_{BE}	$\overline{UB}$, $\overline{LB}$ Enable Low to Output Active	0	—	ns
t_{OD}	Chip Enable ($\overline{CE1s}$ High or CE2s Low) to Output High-Z	—	35	ns
t_{ODO}	Output Enable High to Output High-Z	—	35	ns
t_{BD}	$\overline{UB}$, $\overline{LB}$ Output Enable to Output High-Z	—	35	ns
t_{OH}	Output Data Hold Time	10	—	ns

• Read Cycle (Note 1) (SRAM)



Note: $\overline{WE}$ remains HIGH for the read cycle.

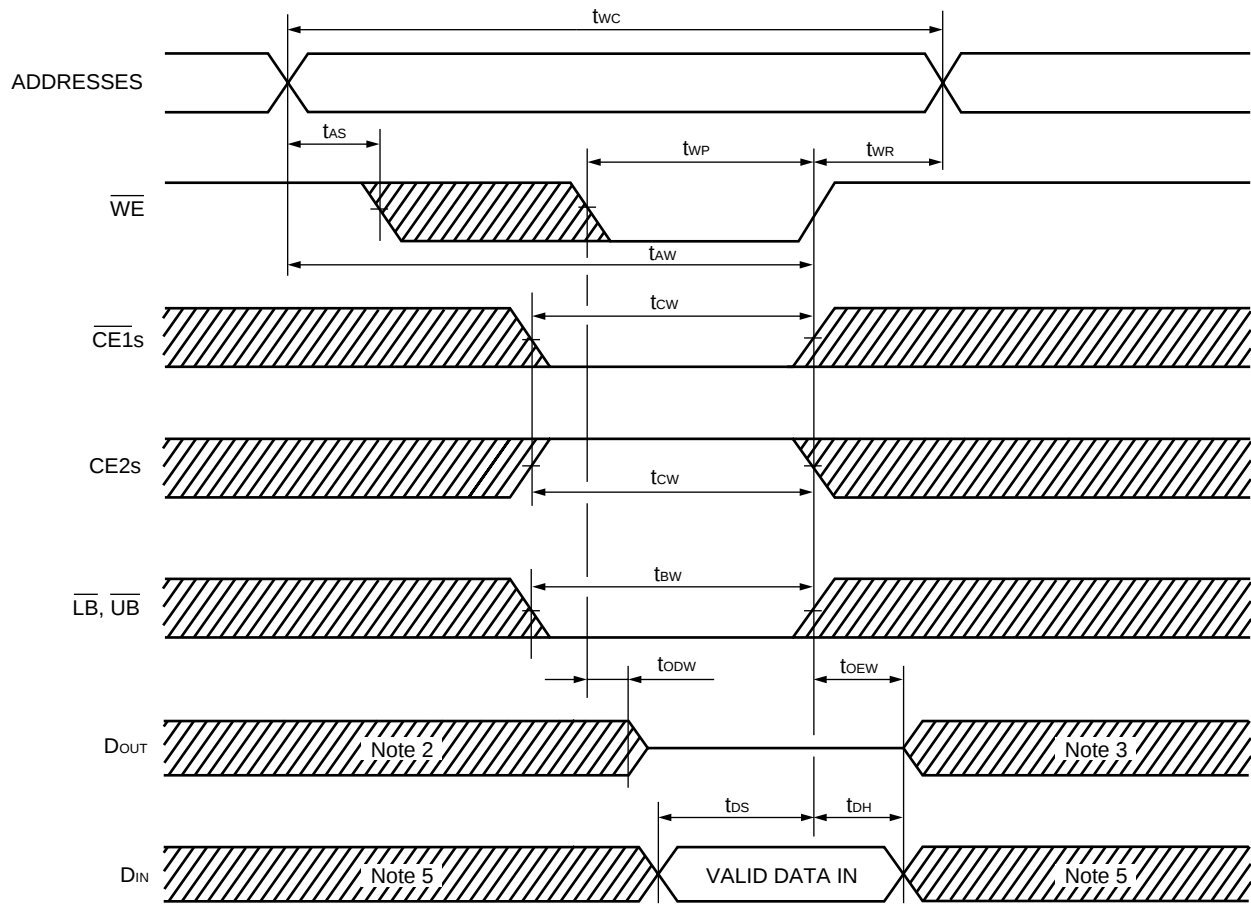
MB84VD2218X/2218XA/2219X/2219XA-10

• Write Cycle (SRAM)

Parameter Symbol	Parameter Description	Min.	Max.	Unit
t _{WC}	Write Cycle Time	85	—	ns
t _{WP}	Write Pulse Width	55	—	ns
t _{CW}	Chip Enable to End of Write	70	—	ns
t _{AW}	Address valid to End of Write	70	—	ns
t _{BW}	$\overline{UB}$, $\overline{LB}$ to End of Write	55	—	ns
t _{AS}	Address Setup Time	0	—	ns
t _{WR}	Write Recovery Time	0	—	ns
t _{ODW}	$\overline{WE}$ Low to Output High-Z	—	35	ns
t _{OEW}	$\overline{WE}$ High to Output Active	0	—	ns
t _{DS}	Data Setup Time	35	—	ns
t _{DH}	Data Hold Time	0	—	ns

MB84VD2218X/2218XA/2219X/2219XA-10

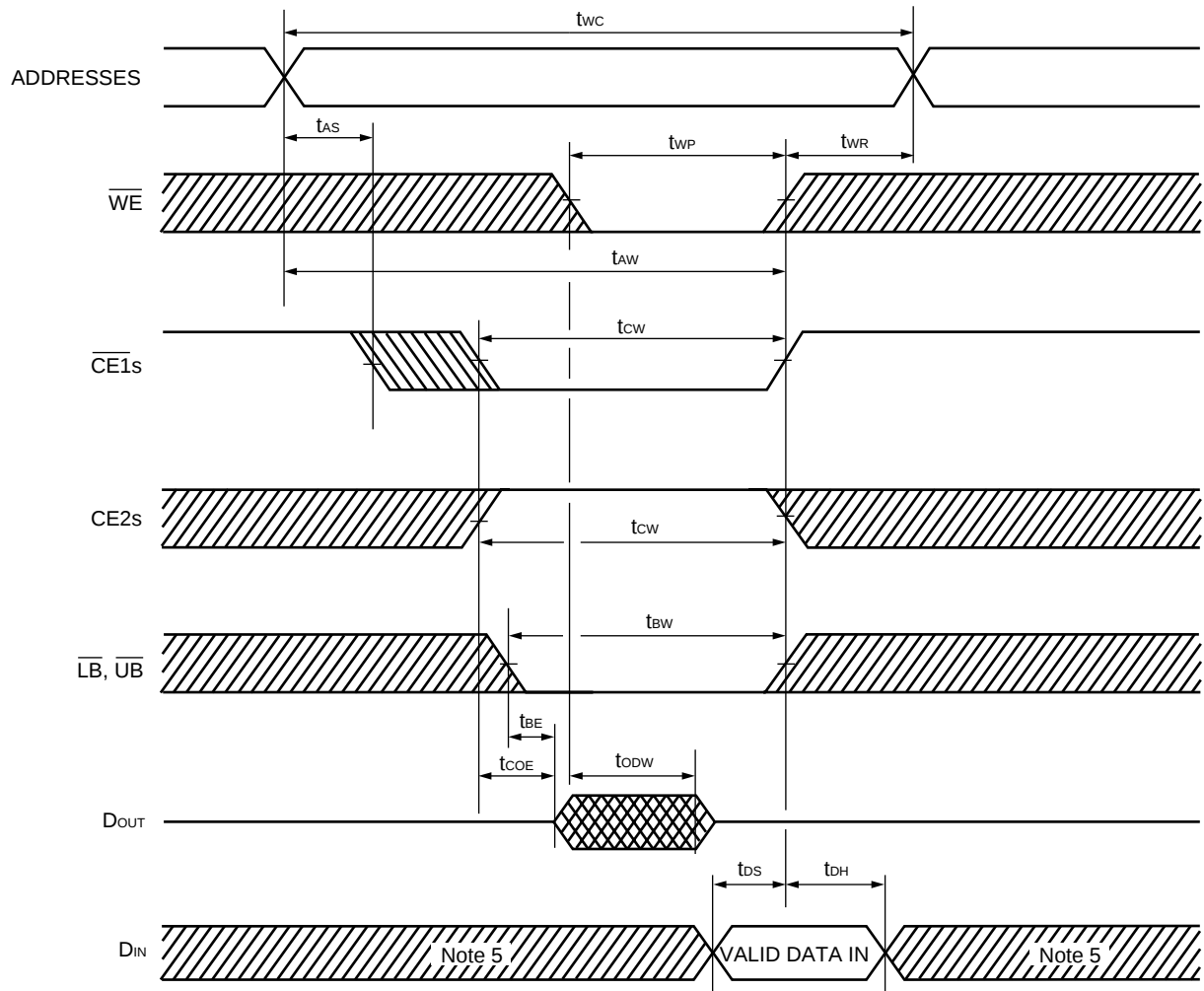
• Write Cycle (Note 4) ($\overline{WE}$ control) (SRAM)



- Notes:
1. If $\overline{CE1s}$ goes LOW (or $\overline{CE2s}$ goes HIGH) coincident with or after $\overline{WE}$ goes LOW, the output will remain at high impedance.
 2. If $\overline{CE1s}$ goes HIGH (or $\overline{CE2s}$ goes LOW) coincident with or before $\overline{WE}$ goes HIGH, the output will remain at high impedance.
 3. If $\overline{OE}$ is HIGH during the write cycle, the outputs will remain at high impedance.
 4. Because I/O signals may be in the output state at this Time, input signals of reverse polarity must not be applied.

MB84VD2218X/2218XA/2219X/2219XA-10

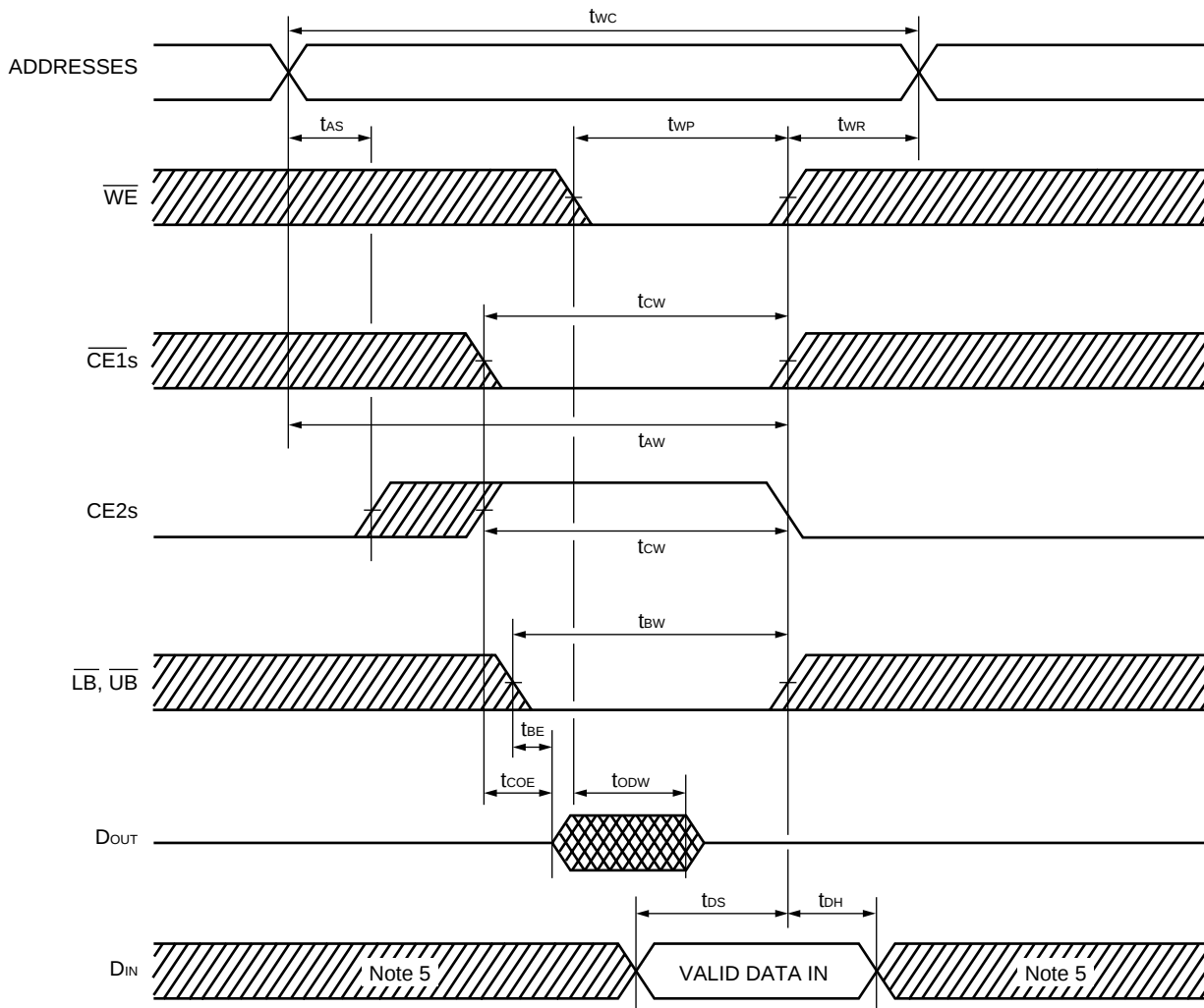
• Write Cycle (Note 4) ($\overline{\text{CE1s}}$ control) (SRAM)



- Notes:
1. If $\overline{\text{CE1s}}$ goes LOW (or $\overline{\text{CE2s}}$ goes HIGH) coincident with or after $\overline{\text{WE}}$ goes LOW, the output will remain at high impedance.
 2. If $\overline{\text{CE1s}}$ goes HIGH (or $\overline{\text{CE2s}}$ goes LOW) coincident with or before $\overline{\text{WE}}$ goes HIGH, the output will remain at high impedance.
 3. If $\overline{\text{OE}}$ is HIGH during the write cycle, the outputs will remain at high impedance.
 4. Because I/O signals may be in the output state at this Time, input signals of reverse polarity must not be applied.

MB84VD2218X/2218XA/2219X/2219XA-10

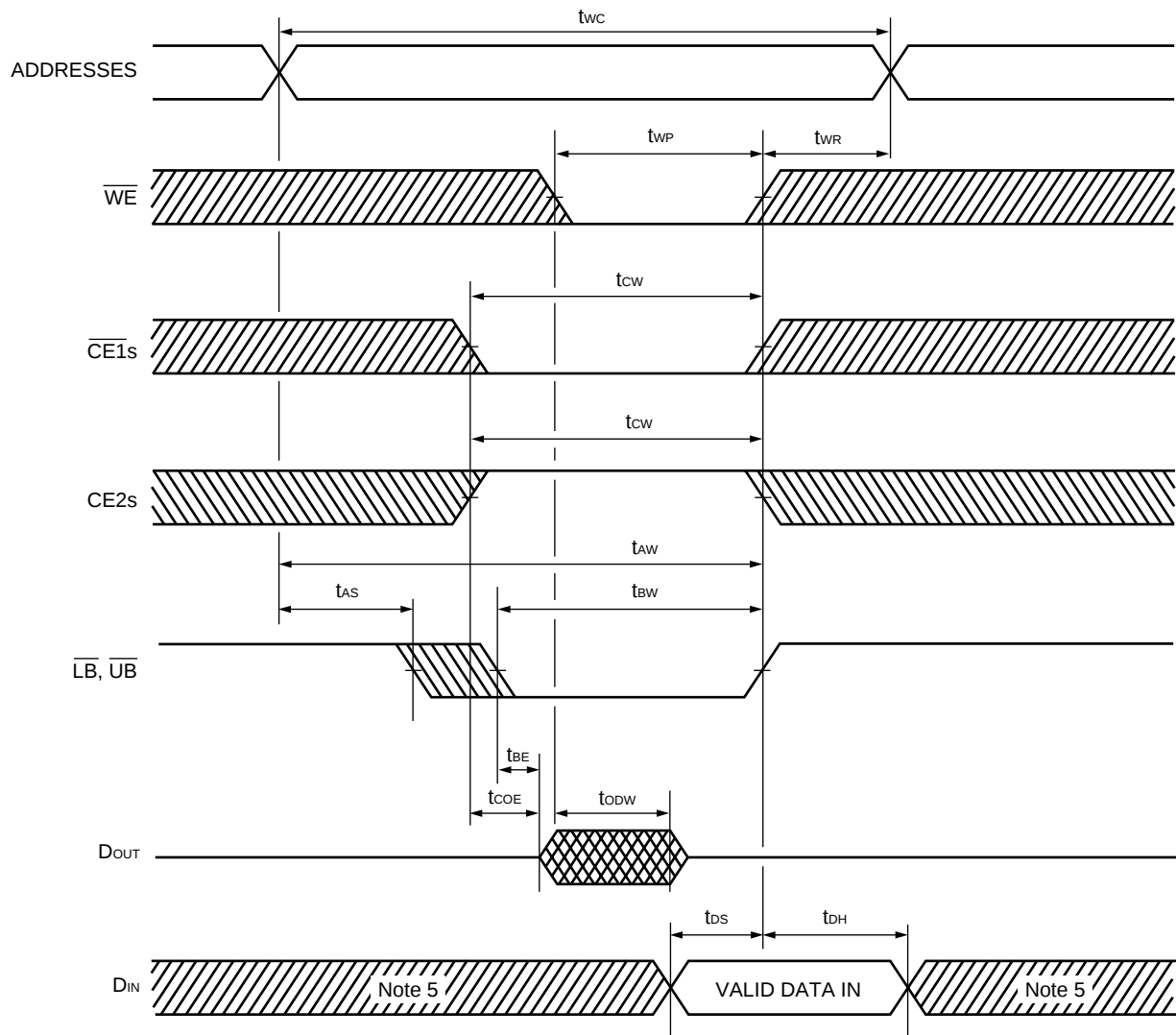
• Write Cycle (Note 4) (CE2s Control) (SRAM)



- Notes:
1. If $\overline{CE1s}$ goes LOW (or $CE2s$ goes HIGH) coincident with or after $\overline{WE}$ goes LOW, the output will remain at high impedance.
 2. If $\overline{CE1s}$ goes HIGH (or $CE2s$ goes LOW) coincident with or before $\overline{WE}$ goes HIGH, the output will remain at high impedance.
 3. If $\overline{OE}$ is HIGH during the write cycle, the outputs will remain at high impedance.
 4. Because I/O signals may be in the output state at this Time, input signals of reverse polarity must not be applied.

MB84VD2218X/2218XA/2219X/2219XA-10

• Write Cycle (Note 4) ($\overline{\text{LB}}$, $\overline{\text{UB}}$ Control) (SRAM)



- Notes:
1. If $\overline{\text{CE1s}}$ goes LOW (or $\overline{\text{CE2s}}$ goes HIGH) coincident with or after $\overline{\text{WE}}$ goes LOW, the output will remain at high impedance.
 2. If $\overline{\text{CE1s}}$ goes HIGH (or $\overline{\text{CE2s}}$ goes LOW) coincident with or before $\overline{\text{WE}}$ goes HIGH, the output will remain at high impedance.
 3. If $\overline{\text{OE}}$ is HIGH during the write cycle, the outputs will remain at high impedance.
 4. Because I/O signals may be in the output state at this Time, input signals of reverse polarity must not be applied.

MB84VD2218X/2218XA/2219X/2219XA-10

■ ERASE AND PROGRAMMING PERFORMANCE (Flash)

Parameter	Limits			Unit	Comment
	Min.	Typ.	Max.		
Sector Erase Time	—	1	10	sec	Excludes programming time prior to erasure
Byte Programming Time	—	8	300	μs	Excludes system-level overhead
Word Programming Time	—	16	360	μs	Excludes system-level overhead
Chip Programming Time	—	—	100	sec	Excludes system-level overhead
Erase/Program Cycle	100,000	—	—	cycles	

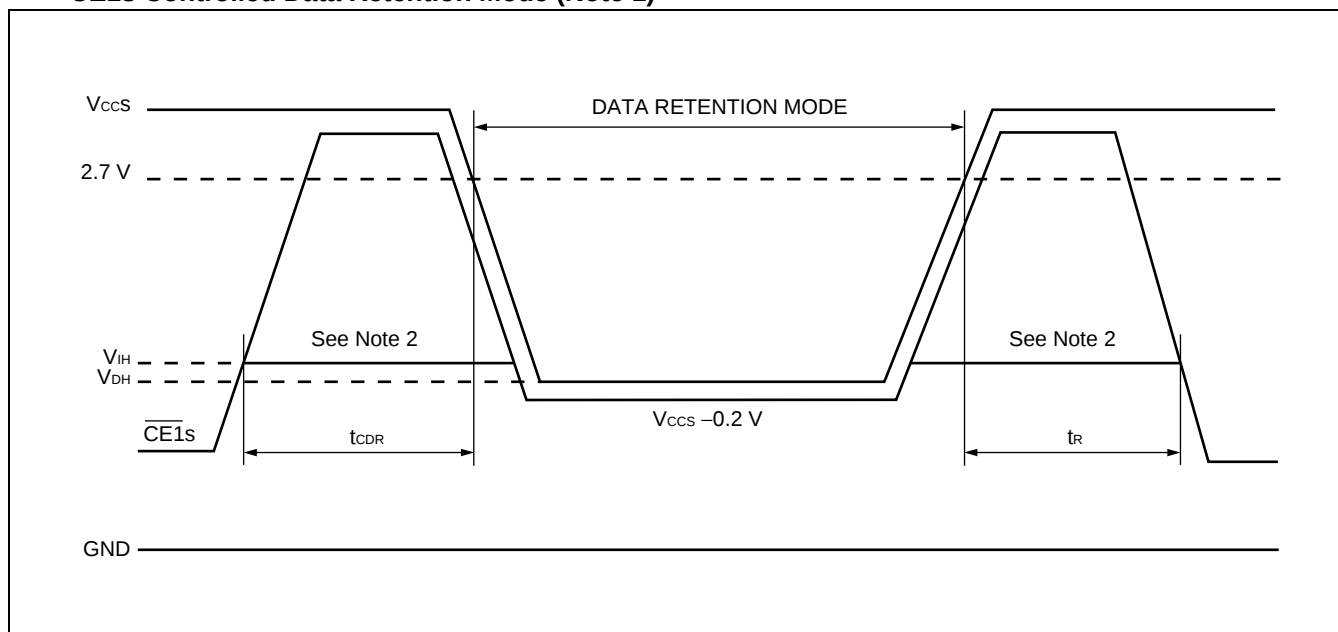
■ DATA RETENTION CHARACTERISTICS (SRAM)

Parameter Symbol	Parameter Description		Min.	Typ.	Max.	Unit
V _{DH}	Data Retention Supply Voltage		1.5	—	3.6	V
I _{DD2}	Standby Current	V _{DH} = 3.0 V	—	0.2	7*	μA
t _{CDR}	Chip Deselect to Data Retention Mode Time		0	—	—	ns
t _R	Recovery Time		t _{RC}	—	—	ns

Note: t_{RC}: Read cycle time

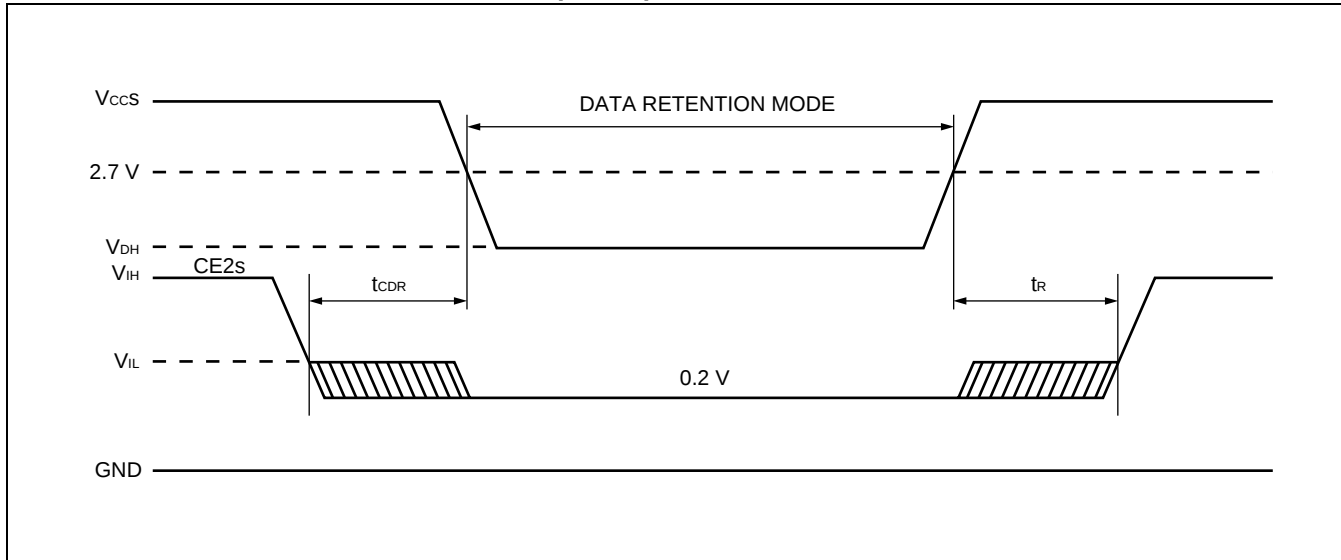
*: 4μA Max. at TA ≤ 60°C, 1μA Max. at TA ≤ 40°C (MB84VD2218XA/MB84VD2219XA)

• $\overline{\text{CE1s}}$ Controlled Data Retention Mode (Note 1)



MB84VD2218X/2218XA/2219X/2219XA-10

• CE2s Controlled Data Retention Mode (Note 3)



- Notes: 1. In $\overline{\text{CE1s}}$ controlled data retention mode, input level of CE2s should be fixed Vccs to Vccs-0.2 V or Vss to 0.2 V during data retention mode. Other input and input/output pins can be used between -0.3 V to Vccs+0.3 V.
2. When $\overline{\text{CE1s}}$ is operating at the Vih min. level (2.2 V), the standby current is given by ISB1S during the transition of Vccs from 3.6 to 2.2 V.
3. In CE2s controlled data retention mode, input and input/output pins can be used between -0.3 V to Vccs+0.3 V.

■ PIN CAPACITANCE

Parameter Symbol	Parameter Description	Test Setup	Typ.	Max.	Unit
C _{IN}	Input Capacitance	V _{IN} = 0	11	14	pF
C _{OUT}	Output Capacitance	V _{OUT} = 0	12	16	pF
C _{IN2}	Control Pin Capacitance	V _{IN} = 0	14	16	pF
C _{IN3}	$\overline{\text{WP/ACC}}$ Pin Capacitance	V _{IN} = 0	21.5	26	pF

Note: Test conditions T_A = 25°C, f = 1.0 MHz

MB84VD2218X/2218XA/2219X/2219XA-10

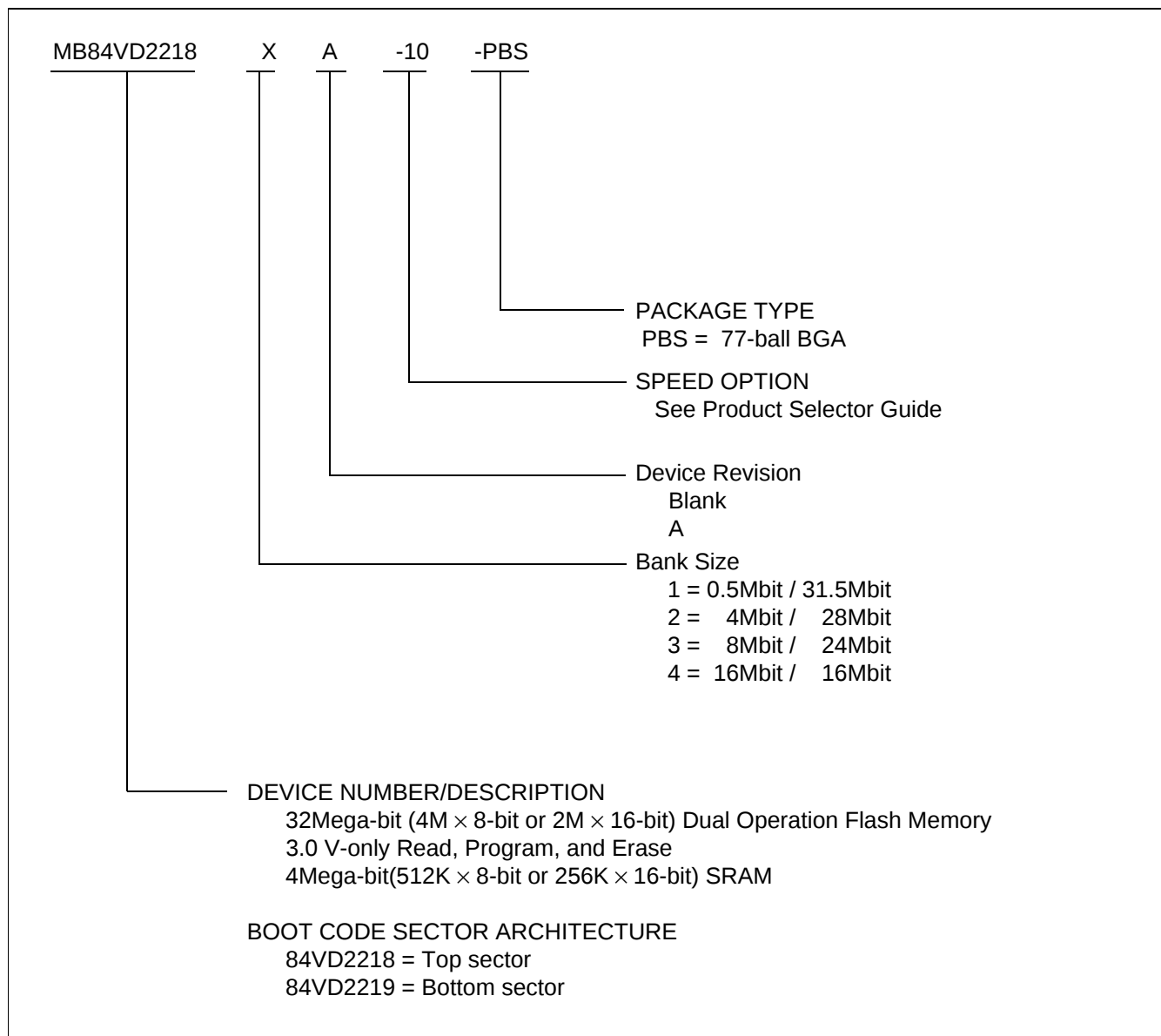
■ HANDLING OF PACKAGE

Please handle this package carefully since the sides of packages are right angle.

■ CAUTION

- 1) The high voltage (V_{ID}) can not apply to address pins and control pins except $\overline{RESET}$. Therefore, it can not use autoselect and sector protect function by applying the high voltage (V_{ID}) to specific pins.
- 2) For the sector protection, since the high voltage (V_{ID}) can be applied to the $\overline{RESET}$, it can be protected the sector using "Extended sector protect" command.

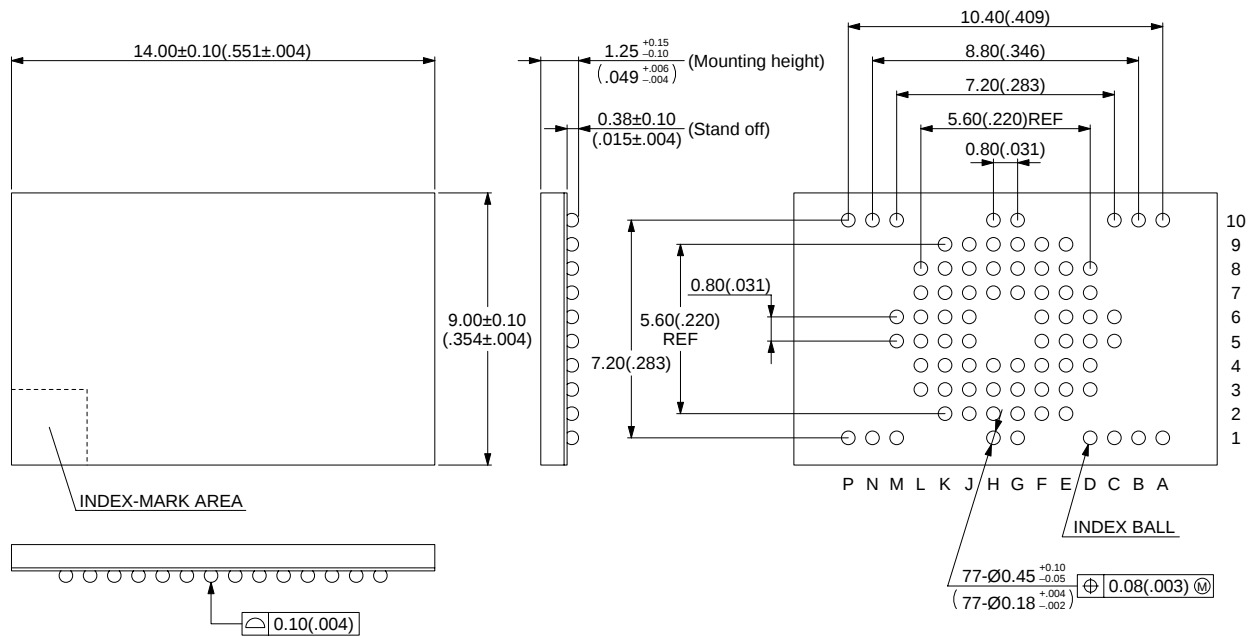
■ ORDERING INFORMATION



MB84VD2218X/2218XA/2219X/2219XA-10

■ PACKAGE DIMENSION

77-ball plastic BGA
(BGA-77P-M01)



© 1999 FUJITSU LIMITED B77001S-1C-1

Dimensions in: mm (inches)

MB84VD2218X/2218XA/2219X/2219XA-10

FUJITSU LIMITED

For further information please contact:

Japan

FUJITSU LIMITED
Corporate Global Business Support Division
Electronic Devices
KAWASAKI PLANT, 4-1-1, Kamikodanaka
Nakahara-ku, Kawasaki-shi
Kanagawa 211-8588, Japan
Tel: 81(44) 754-3763
Fax: 81(44) 754-3329

<http://www.fujitsu.co.jp/>

North and South America

FUJITSU MICROELECTRONICS, INC.
Semiconductor Division
3545 North First Street
San Jose, CA 95134-1804, USA
Tel: (408) 922-9000
Fax: (408) 922-9179

Customer Response Center
Mon. - Fri.: 7 am - 5 pm (PST)
Tel: (800) 866-8608
Fax: (408) 922-9179

<http://www.fujitsumicro.com/>

Europe

FUJITSU MICROELECTRONICS EUROPE GmbH
Am Siebenstein 6-10
D-63303 Dreieich-Buchschlag
Germany
Tel: (06103) 690-0
Fax: (06103) 690-122

<http://www.fujitsu-edc.com/>

Asia Pacific

FUJITSU MICROELECTRONICS ASIA PTE LTD
#05-08, 151 Lorong Chuan
New Tech Park
Singapore 556741
Tel: (65) 281-0770
Fax: (65) 281-0220

<http://www.fmap.com.sg/>

F9909

© FUJITSU LIMITED Printed in Japan

All Rights Reserved.

The contents of this document are subject to change without notice. Customers are advised to consult with FUJITSU sales representatives before ordering.

The information and circuit diagrams in this document are presented as examples of semiconductor device applications, and are not intended to be incorporated in devices for actual use. Also, FUJITSU is unable to assume responsibility for infringement of any patent rights or other rights of third parties arising from the use of this information or circuit diagrams.

FUJITSU semiconductor devices are intended for use in standard applications (computers, office automation and other office equipment, industrial, communications, and measurement equipment, personal or household devices, etc.).

CAUTION:

Customers considering the use of our products in special applications where failure or abnormal operation may directly affect human lives or cause physical injury or property damage, or where extremely high levels of reliability are demanded (such as aerospace systems, atomic energy controls, sea floor repeaters, vehicle operating controls, medical devices for life support, etc.) are requested to consult with FUJITSU sales representatives before such use. The company will not be responsible for damages arising from such use without prior approval.

Any semiconductor devices have an inherent chance of failure. You must protect against injury, damage or loss from such failures by incorporating safety design measures into your facility and equipment such as redundancy, fire protection, and prevention of over-current levels and other abnormal operating conditions.

If any products described in this document represent goods or technologies subject to certain restrictions on export under the Foreign Exchange and Foreign Trade Law of Japan, the prior authorization by Japanese government will be required for export of those products from Japan.