Addendum

HC908JB8AD/D
Rev. 0, 4/2002

Addendum to
MC68HC908JB8
Technical Data

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This addendum provides additional information to the
MC68HC908JB8 Technical Data, Rev. 2
(Motorola document number MC68HC908JB8/D),

MC68HC08JB8A

The MC68HC08JB8A is the ROM part equivalent to the MC68HC908JB8. The entire MC68HC908JB8 data book apply to this ROM device, with exceptions outlined in this addendum.

Table 1. Summary of MC68HC08JB8A and MC68HC908JB8 Differences

	MC68HC08JB8A	MC68HC908JB8
Memory ($DC00–$FBFF)	8,192 bytes ROM	8,192 bytes FLASH
User vectors ($FFF0–$FFFF)	16 bytes ROM	16 bytes FLASH
Registers at $FE08 and $FF09	Not used; locations are reserved.	FLASH related registers. $FE08 — FLCR $FF09 — FLBPR
Monitor ROM ($FC00–$FDFF and $FE10–$FFDF)	$FC00–$FDFF: Not used. $FE10–$FFDF: Used for testing purposes only.	Used for testing and FLASH programming/erasing.
OSC1 and OSC2 pins	V_{DD} level (5V logic)	V_{REG} level (3.3V logic)

MCU Block Diagram

Figure 1 shows the block diagram of the MC68HC08JB8A.

Memory Map

The MC68HC08JB8A has 8,192 bytes of user ROM from $DC00 to $FBFF, and 16 bytes of user ROM vectors from $FFF0 to $FFFF. On the MC68HC908JB8, these memory locations are FLASH memory.

Figure 2 shows the memory map of the MC68HC08JB8A.

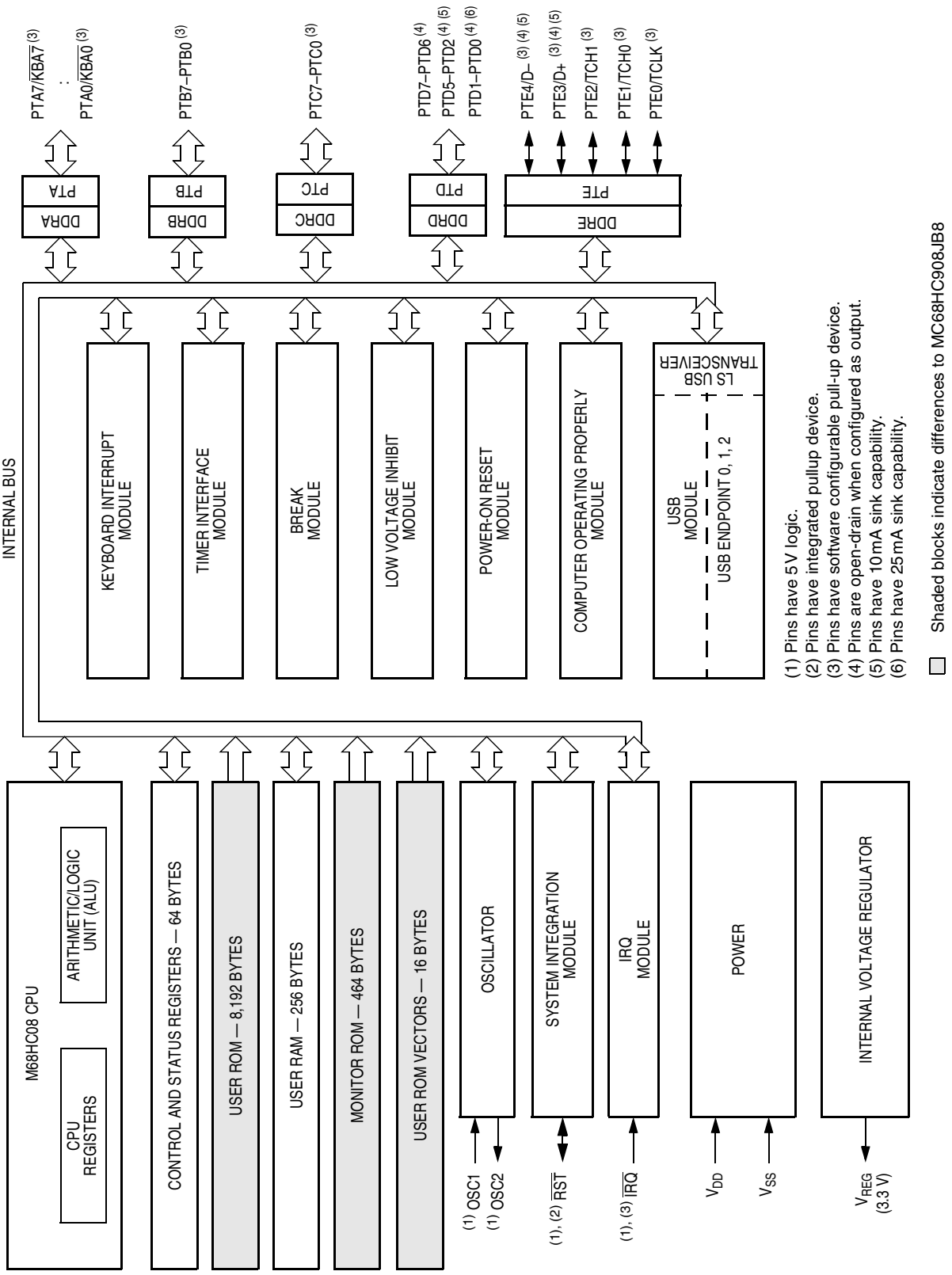

Figure 1. MC68HC08JB8A Block Diagram

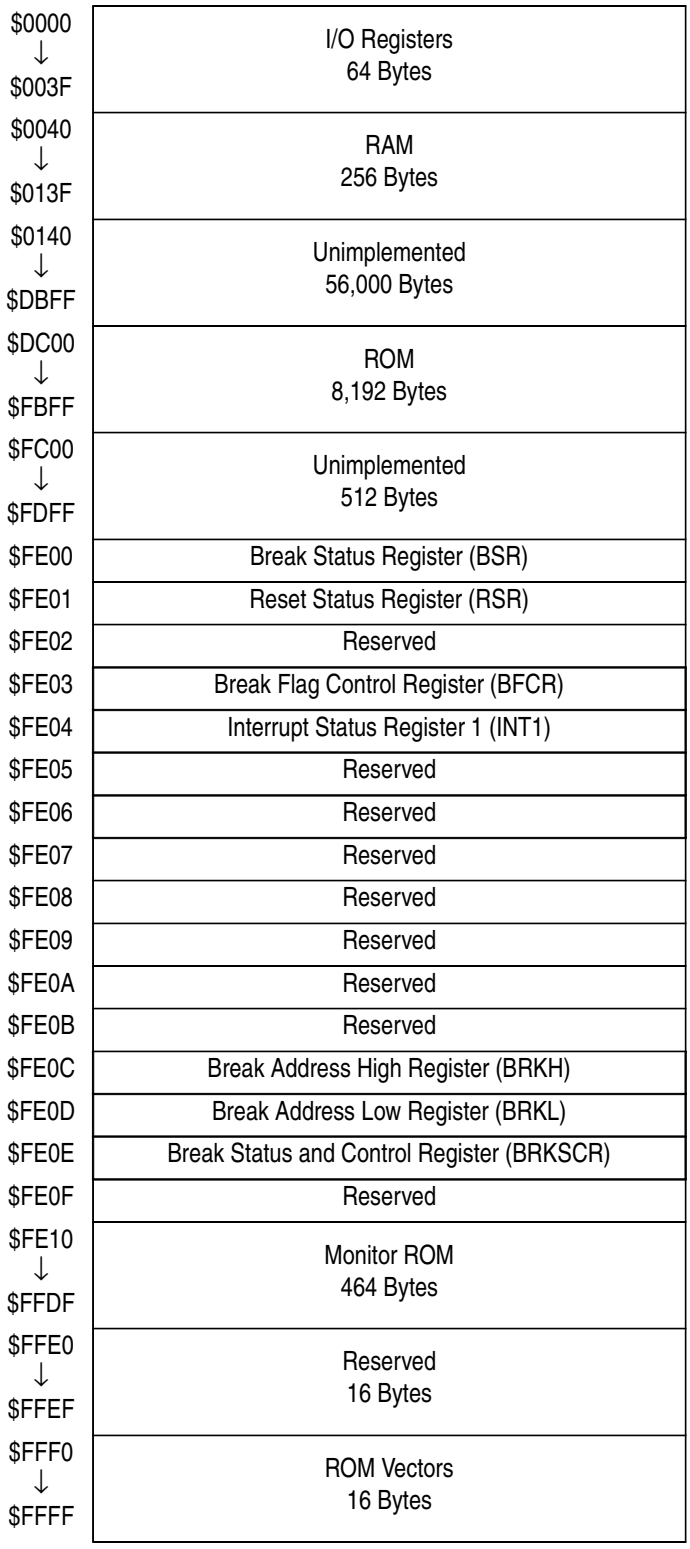

Figure 2. MC68HC08JB8A Memory Map

Reserved Registers

The two registers at $FE08 and $FE09 are reserved locations on the MC68HC08JB8A.

On the MC68HC908JB8, these two locations are the FLASH control register and the FLASH block protect register respectively.

Monitor ROM

The monitor program (monitor ROM: $FE10–$FFDF) on the MC68HC08JB8A is for device testing only. $FC00–$FDFF are unused.

Electrical Specifications

Electrical specifications for the MC68HC908JB8 apply to the MC68HC08JB8A, except for the parameters indicated below.

DC Electrical Characteristics

Table 2. DC Electrical Characteristics

Characteristic[1]	Symbol	Min	Typ[2]	Max	Unit
Regulator output voltage	V_{REG}	3.0	3.3	3.6	V
Output high voltage (I_{Load} = −2.0 mA) PTA0–PTA7, PTB0–PTB7, PTC0–PTC7, PTE0–PTE2	V_{OH}	V_{REG}−0.8	—	—	V
Output low voltage (I_{Load} = 1.6 mA) All I/O pins (I_{Load} = 25 mA) PTD0–PTD1 in ILDD mode (I_{Load} = 10 mA) PTE3–PTE4 with USB disabled	V_{OL}	— — —	— — —	0.4 0.5 0.4	V
Input high voltage All ports, OSC1 $\overline{IRQ}$, $\overline{RST}$	V_{IH}	$0.7 \times V_{REG}$ $0.7 \times V_{DD}$	— —	V_{REG} V_{DD}	V
Input low voltage All ports, OSC1 $\overline{IRQ}$, $\overline{RST}$	V_{IL}	V_{SS} V_{SS}	— —	$0.3 \times V_{REG}$ $0.3 \times V_{DD}$	V
Output low current (V_{OL} = 2.0 V) PTD2–PTD5 in LDD mode	I_{OL}	12 (17)	17 (22)	22 (27)	mA
V_{DD} supply current, V_{DD} = 5.25V, f_{OP} = 3MHz Run, with low speed USB[3] Run, with USB suspended[3] Wait, with low speed USB[4] Wait, with USB suspended[4] Stop[5] 0 °C to 70°C	I_{DD}	 — — — — —	 6.0 (5.0) 5.5 (4.5) 4.0 (3.0) 3.0 (2.5) 30	 7.5 6.5 5.0 4.0 100	 mA mA mA mA µA

Table 2. DC Electrical Characteristics

Characteristic[1]	Symbol	Min	Typ[2]	Max	Unit
I/O ports Hi-Z leakage current	I_{IL}	—	—	± 10	μA
Input current	I_{IN}	—	—	± 1	μA
Capacitance Ports (as input or output)	C_{Out} C_{In}	— —	— —	12 8	pF
POR re-arm voltage[6]	V_{POR}	0	—	100	mV
POR rise-time ramp rate[7]	R_{POR}	0.035	—	—	V/ms
Monitor mode entry voltage	$V_{DD}+V_{HI}$	$1.4 \times V_{DD}$		$2 \times V_{DD}$	V
Pullup resistors Port A, port B, port C, PTE0–PTE2, $\overline{RST}$, $\overline{IRQ}$ PTE3–PTE4 (with USB module disabled) D– (with USB module enabled)	R_{PU}	25 4 1.2	40 5 1.5	55 6 2.0	kΩ
LVI reset	V_{LVR}	2.8 (2.4)	3.3 (2.7)	3.8 (3.0)[8]	V

1. V_{DD} = 4.0 to 5.5 Vdc, V_{SS} = 0 Vdc, $T_A = T_L$ to T_H, unless otherwise noted.
2. Typical values reflect average measurements at midpoint of voltage range, 25 °C only.
3. Run (operating) I_{DD} measured using external square wave clock source (f_{XCLK} = 6 MHz). All inputs 0.2 V from rail. No dc loads. Less than 100 pF on all outputs. C_L = 20 pF on OSC2. All ports configured as inputs. OSC2 capacitance linearly affects run I_{DD}. Measured with all modules enabled.
4. Wait I_{DD} measured using external square wave clock source (f_{XCLK} = 6 MHz); all inputs 0.2 V from rail; no dc loads; less than 100 pF on all outputs. C_L = 20 pF on OSC2; 15 kΩ ± 5% termination resistors on D+ and D– pins; all ports configured as inputs; OSC2 capacitance linearly affects wait I_{DD}
5. STOP I_{DD} measured with USB in suspend mode; OSC1 grounded; transceiver pullup resistor of 1.5 kΩ ± 5% between V_{REG} and D– pins and 15 kΩ ± 5% termination resistor on D+ pin; no port pins sourcing current.
6. Maximum is highest voltage that POR is guaranteed.
7. If minimum V_{REG} is not reached before the internal POR reset is released, $\overline{RST}$ must be driven low externally until minimum V_{REG} is reached.
8. The numbers in parenthesis are MC68HC08JB8 (non-A part) values.

Memory Characteristics

Table 3. Memory Characteristics

Characteristic	Symbol	Min	Max	Unit
RAM data retention voltage	V_{RDR}	1.3	—	V

Notes:
Since MC68HC08JB8A is a ROM device, FLASH memory electrical characteristics do not apply.

MC68HC08JB8A Order Numbers

These part numbers are generic numbers only. To place an order, ROM code must be submitted to the ROM Processing Center (RPC).

Table 4. MC68HC08JB8A Order Numbers

MC order number	Package	Operating temperature range
MC68HC08JB8AJP	20-pin PDIP	0 °C to +70 °C
MC68HC08JB8AJDW	20-pin SOIC	0 °C to +70 °C
MC68HC08JB8AADW	28-pin SOIC	0 °C to +70 °C
MC68HC08JB8AFB	44-pin QFP	0 °C to +70 °C

MC68HC08JB8A and MC68HC08JB8 Differences

The MC68HC08JB8A and MC68HC08JB8 are identical devices, except for the following:

Table 5. MC68HC08JB8A and MC68HC08JB8 Differences

	MC68HC08JB8A	MC68HC08JB8
OSC1 and OSC2 pins	V_{DD} level (5V logic)	V_{REG} level (3.3V logic)
Output low current on PTD2–PTD5 in LDD mode	See **Table 2 . DC Electrical Characteristics**. The numbers in parenthesis are MC68HC08JB8 values.	
Operating I_{DD} currents		
LVI trip points		

NOTES

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