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Applications of "<u>Embedded - Microcontrollers</u>"

Details	
Product Status	Active
Core Processor	HC08
Core Size	8-Bit
Speed	6MHz
Connectivity	SCI, USB
Peripherals	LED, LVD, POR, PWM
Number of I/O	13
Program Memory Size	12KB (12K x 8)
Program Memory Type	FLASH
EEPROM Size	-
RAM Size	384 x 8
Voltage - Supply (Vcc/Vdd)	4V ~ 5.5V
Data Converters	-
Oscillator Type	Internal
Operating Temperature	0°C ~ 70°C (TA)
Mounting Type	Surface Mount
Package / Case	20-SOIC (0.295", 7.50mm Width)
Supplier Device Package	20-SOIC
Purchase URL	https://www.e-xfl.com/pro/item?MUrl=&PartUrl=mc908jb12jdwe

Email: info@E-XFL.COM

Address: Room A, 16/F, Full Win Commercial Centre, 573 Nathan Road, Mongkok, Hong Kong



Freescale Semiconductor Application Note

Document Number: HC908JB16AD/D

Rev. 1, 03/2010

Addendum to MC68HC908JB16 Technical Data

This addendum provides update and additional information to the *MC68HC908JB16 Technical Data*, Rev. 1.1 (Freescale document number MC68HC908JB16/D).

pertaining to the following:

- MC68HC908JB16
 - Update to V_{REG} LVI trip point
 - 20-pin SOIC package
- MC68HC908JB12

MC68HC908JB16

This section updates data sheet information and introduces the 20-pin SOIC package for the MC68HC908JB16. These updates apply to the 20-pin SOIC only.

V_{REG} LVI Trip Point

Page 318, entry for minimum V_{RFG} LVI trip point voltage has been updated.

From:

Characteristic	Symbol	Min	Тур	Max	Unit
V _{REG} LVI trip point voltage	V_{LVR}	2.0	2.2	2.6	V

To:

V _{REG} LVI trip point voltage	V_{LVR}	1.9	2.2	2.6	V





MC68HC908JB16

Output Low Voltage

Page 318, entry for maximum V_{OL} has been updated.

From:

Characteristic	Symbol	Min	Тур	Max	Unit
Output low voltage (I _{Load} = 25 mA) PTD0–PTD1 in ILDD mode	V _{OL}	_	_	0.5	V

To:

20-Pin SOIC Order Number: **MC68HC908JB16JDW**

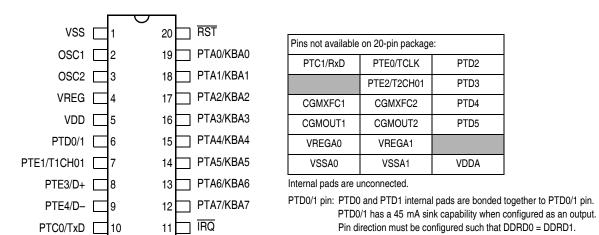
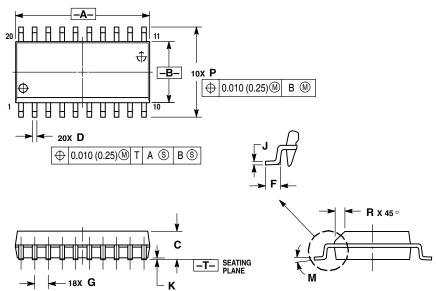


Figure 1. 20-Pin SOIC Pin Assignment

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- NOTES:
 1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: MILLIMETER.
 3. DIMENSIONS A AND B DO NOT INCLUDE MOLD PROTRUSION.
 4. MAXIMUM MOLD PROTRUSION 0.150
- 4. MAXIMUM MULD PHOTHOSION 0.130 (0.006) PER SIDE.
 5. DIMENSION D DOES NOT INCLUDE DAMBAR PROTRUSION. ALLOWABLE DAMBAR PROTRUSION SHALL BE 0.13 (0.005) TOTAL IN EXCESS OF D DIMENSION AT MAXIMUM MATERIAL CONDITION.

	MILLIMETERS		INC	HES
DIM	MIN	MAX	MIN	MAX
Α	12.65	12.95	0.499	0.510
В	7.40	7.60	0.292	0.299
O	2.35	2.65	0.093	0.104
ם	0.35	0.49	0.014	0.019
F	0.50	0.90	0.020	0.035
G	1.27	BSC	0.050	BSC
J	0.25	0.32	0.010	0.012
K	0.10	0.25	0.004	0.009
М	0 °	7 °	0 °	7°
Р	10.05	10.55	0.395	0.415
R	0.25	0.75	0.010	0.029

Figure 2. 20-Pin SOIC Mechanical Dimensions (Case No. 751D)





MC68HC908JB12

This section introduces the MC68HC908JB12, a derivative of the MC68HC908JB16. The entire MC68HC908JB16 data book, including the updates in this addendum, applies to this device, with exceptions outlined below.

Table 1. Summary of MC68HC908JB12 and MC68HC908JB16 Differences

	MC68HC908JB12	MC68HC908JB16
FLASH Memory	12,288 bytes (\$CA00–\$F9FF)	16,384 bytes (\$BA00–\$F9FF)
Dual Clock Generator Module	Not implemented. \$0051–\$0059 unimplemented.	Yes
Available Packages ⁽¹⁾	— 28-pin SOIC 20-pin SOIC	32-pin LQFP 28-pin SOIC 20-pin SOIC

^{1.} The pin assignments are identical for both devices; see data sheet.

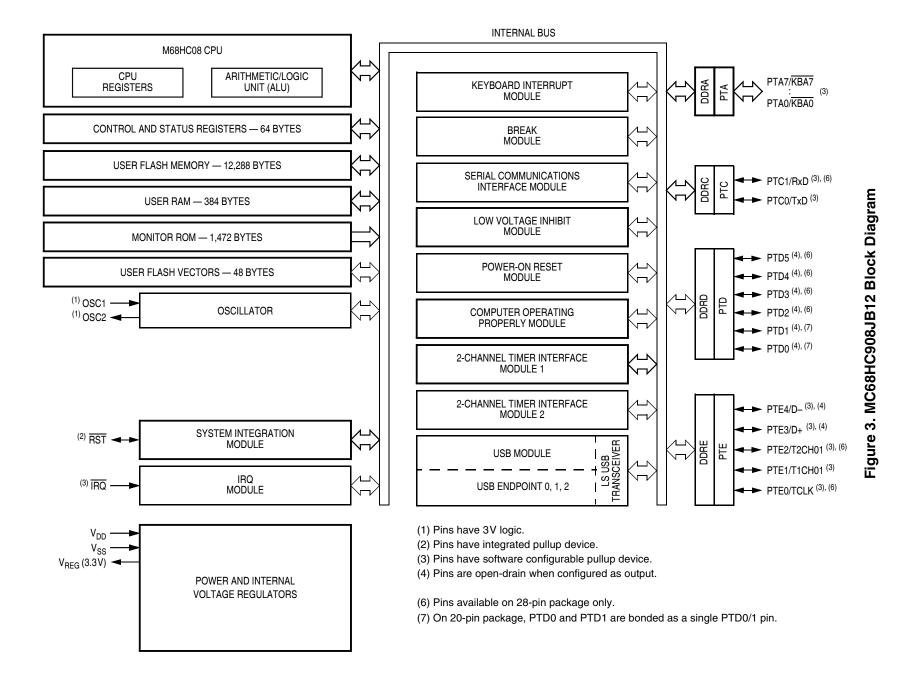
MCU Block Diagram Figure 3 shows the structure of the MC68HC908JB12.

Memory Map Figure 4 shows the memory map of the MC68HC908JB12.

Dual Clock Generator Module

The dual 27-MHz clock generator module on the MC68HC908JB16 is not designed in the MC68HC908JB12, hence, register locations from \$0051 to \$0059 are unimplemented. Information in the data book relating to the CGM do not apply to the MC68HC908JB12.







MC68HC908JB12

\$0000 \$007F \$0080 \$0080 \$0080 \$001FF \$0200 \$0200 \$020FF \$0200 \$020FLASH Memory \$12,288 Bytes \$0200 \$020FF		
\$0007F \$0080 \$01FF \$0200 Unimplemented \$1,200 Bytes \$CA00 \$FLASH Memory \$12,288 Bytes \$FA00 Monitor ROM 1 \$1,024 Bytes \$FEDF \$FE00 SIM Break Status Register (SBSR) \$FE01 SFE02 Reserved \$FE03 SIM Break Flag Control Register (SBFCR) \$FE04 Interrupt Status Register 1 (INT1) \$FE05 Interrupt Status Register 2 (INT2) \$FE06 \$FE07 Reserved \$FE07 Reserved \$FE08 FFE08 FLASH Control Register (FLCR) \$FE09 FLASH Block Protect Register (FLBPR) \$FE00 Break Address Register High (BRKH) \$FE0D Break Address Register Low (BRKL) \$FE0F Reserved \$FE0F FLASH Control Register (BRKSCR) \$FE0F FREOD Break Address Register Low (BRKL) \$FE0D FLASH Break Status and Control Register (BRKSCR) \$FE0F FREOF FREOF FREOF FREOF FREOF FREOF FREOF FLASH Vectors \$48 Bytes	\$0000	•
\$01FF \$0200 ↓ \$C9FF \$CA00 ↓ \$F9FF \$CA00 ↓ \$F9FF \$FA00 ↓ \$F0FF \$F00 \$IM Break Status Register (SBSR) \$FE01 \$SFE02 \$Reserved \$FE03 \$SIM Break Flag Control Register (SBFCR) \$FE04 \$Interrupt Status Register 1 (INT1) \$FE05 \$Interrupt Status Register 2 (INT2) \$FE06 \$FE07 \$Reserved \$FE07 \$FE08 \$FLASH Control Register (FLCR) \$FE09 \$FE09 \$FLASH Block Protect Register (FLBPR) \$FE09 \$FE00	\$007F	128 Bytes
SC9FF \$CA00 \$C9FF \$CA00 \$FLASH Memory 12,288 Bytes \$FA00 \$FDFF \$FA00 \$FDFF \$SFE00 \$IM Break Status Register (SBSR) \$FE01 \$SIM Reset Status Register (SRSR) \$FE02 \$Reserved \$FE03 \$IM Break Flag Control Register (SBFCR) \$FE04 Interrupt Status Register 1 (INT1) \$FE05 Interrupt Status Register 2 (INT2) \$FE06 \$FE07 \$Reserved \$FE07 \$Reserved \$FE08 \$FLASH Control Register (FLCR) \$FE09 \$FLASH Block Protect Register (FLBPR) \$FE0A \$Reserved \$FE0B \$Reserved \$FE0D Break Address Register High (BRKH) \$FE0D \$FE0F \$Reserved \$FE0F \$Reserved \$FE0F \$FE0F \$Reserved \$FE0F \$FE0F \$Reserved \$FE0F \$FEOF \$FEOF \$FEOF \$FEOF \$FEOF \$FEOF \$FEND \$FLASH Vectors \$A8 Bytes	\$0080	RAM
SC9FF \$CA00 \$FLASH Memory 12,288 Bytes \$FA00 \$FA00 \$FDFF \$FE00 SIM Break Status Register (SBSR) \$FE01 SIM Reset Status Register (SRSR) \$FE02 Reserved \$FE03 SIM Break Flag Control Register (SBFCR) \$FE04 Interrupt Status Register 1 (INT1) \$FE05 Interrupt Status Register 2 (INT2) \$FE06 Reserved \$FE07 Reserved \$FE07 Reserved \$FE08 FLASH Control Register (FLCR) \$FE09 FLASH Block Protect Register (FLBPR) \$FE00 \$FE00 Break Address Register High (BRKH) \$FE0D Break Status and Control Register (BRKSCR) \$FE0F Reserved \$FE0F FLASH Vectors 48 Bytes	\$01FF	384 Bytes
\$C9FF \$CA00 \$FLASH Memory 12,288 Bytes \$FA00 Monitor ROM 1 1,024 Bytes \$FE00 \$IM Break Status Register (SBSR) \$FE01 \$SIM Reset Status Register (SRSR) \$FE02 Reserved \$FE03 \$IM Break Flag Control Register (SBFCR) \$FE04 Interrupt Status Register 1 (INT1) \$FE05 Interrupt Status Register 2 (INT2) \$FE06 \$FE07 Reserved \$FE07 Reserved \$FE08 \$FLASH Control Register (FLCR) \$FE09 \$FE0A Reserved \$FE0B \$FE0B Reserved \$FE0B \$FE0C Break Address Register High (BRKH) \$FE0D Break Status and Control Register (BRKSCR) \$FE0F Reserved \$FE0F \$FE0F \$FE0F \$FE0F \$FE0F \$FEND \$FLASH Vectors 48 Bytes	\$0200	Unimplemented
\$F9FF 12,288 Bytes \$FA00	↓ \$C9FF	·
\$F9FF \$FA00 Monitor ROM 1 1,024 Bytes \$FE00 SIM Break Status Register (SBSR) \$FE01 SIM Reset Status Register (SRSR) \$FE02 Reserved \$FE03 SIM Break Flag Control Register (SBFCR) \$FE04 Interrupt Status Register 1 (INT1) \$FE05 Interrupt Status Register 2 (INT2) \$FE06 Reserved \$FE07 Reserved \$FE08 FLASH Control Register (FLCR) \$FE09 FLASH Block Protect Register (FLBPR) \$FE00 \$FE00 Break Address Register High (BRKH) \$FE0D Break Status and Control Register (BRKSCR) \$FE0F Reserved \$FE0F FLASH Vectors 48 Bytes	\$CA00	FLASH Memory
SFDFF \$FDFF \$FDFF \$FE00 SIM Break Status Register (SBSR) \$FE01 SIM Reset Status Register (SRSR) \$FE02 Reserved \$FE03 SIM Break Flag Control Register (SBFCR) \$FE04 Interrupt Status Register 1 (INT1) \$FE05 Interrupt Status Register 2 (INT2) \$FE06 Reserved \$FE07 Reserved \$FE08 FLASH Control Register (FLCR) \$FE09 FLASH Block Protect Register (FLBPR) \$FE0A Reserved \$FE0B Reserved \$FE0B Reserved \$FE0C Break Address Register High (BRKH) \$FE0D Break Status and Control Register (BRKSCR) \$FE0F \$FEND \$FLASH Vectors 48 Bytes	\$F9FF	•
SIM Break Status Register (SBSR) \$FE01	\$FA00	Monitor ROM 1
SIM Reset Status Register (SRSR) \$FE02 Reserved \$FE03 SIM Break Flag Control Register (SBFCR) \$FE04 Interrupt Status Register 1 (INT1) \$FE05 Interrupt Status Register 2 (INT2) \$FE06 Reserved \$FE07 Reserved \$FE08 FLASH Control Register (FLCR) \$FE09 FLASH Block Protect Register (FLBPR) \$FE0A Reserved \$FE0B Reserved \$FE0B Reserved \$FE0C Break Address Register High (BRKH) \$FE0D Break Status and Control Register (BRKSCR) \$FE0F Reserved \$FE10 Monitor ROM 2 448 Bytes \$FFD0 FLASH Vectors 48 Rytes	\$FDFF	1,024 Bytes
\$FE02 SIM Break Flag Control Register (SBFCR) \$FE04 Interrupt Status Register 1 (INT1) \$FE05 Interrupt Status Register 2 (INT2) \$FE06 Reserved \$FE07 Reserved \$FE07 FLASH Control Register (FLCR) \$FE08 FLASH Block Protect Register (FLBPR) \$FE09 FLASH Block Protect Register (FLBPR) \$FE00 Reserved \$FE00 Break Address Register High (BRKH) \$FE00 Break Address Register Low (BRKL) \$FE00 Break Status and Control Register (BRKSCR) \$FE00 Reserved \$FE00 Reserved \$FE00 FLASH Status Address Register (BRKSCR)	\$FE00	SIM Break Status Register (SBSR)
SIM Break Flag Control Register (SBFCR) \$FE04	\$FE01	SIM Reset Status Register (SRSR)
\$FE04 Interrupt Status Register 1 (INT1) \$FE05 Interrupt Status Register 2 (INT2) \$FE06 Reserved \$FE07 Reserved \$FE08 FLASH Control Register (FLCR) \$FE09 FLASH Block Protect Register (FLBPR) \$FE0A Reserved \$FE0B Reserved \$FE0B Reserved \$FE0C Break Address Register High (BRKH) \$FE0D Break Address Register Low (BRKL) \$FE0E Break Status and Control Register (BRKSCR) \$FE0F Reserved \$FE10 ↓ \$FF0F Reserved \$FF10 ↓ \$FF0F FF0F FF0F FLASH Vectors \$FF0F FLASH Vectors \$\$48 Bytes	\$FE02	Reserved
\$FE05 Interrupt Status Register 2 (INT2) \$FE06 Reserved \$FE07 Reserved \$FE08 FLASH Control Register (FLCR) \$FE09 FLASH Block Protect Register (FLBPR) \$FE0A Reserved \$FE0A Reserved \$FE0B Reserved \$FE0D Break Address Register High (BRKH) \$FE0D Break Address Register Low (BRKL) \$FE0E Break Status and Control Register (BRKSCR) \$FE0F Reserved \$FE10 Monitor ROM 2 448 Bytes \$FFD0 \$FFD0 \$FLASH Vectors 48 Bytes	\$FE03	SIM Break Flag Control Register (SBFCR)
\$FE06 Reserved \$FE07 Reserved \$FE08 FLASH Control Register (FLCR) \$FE09 FLASH Block Protect Register (FLBPR) \$FE0A Reserved \$FE0B Reserved \$FE0C Break Address Register High (BRKH) \$FE0D Break Address Register Low (BRKL) \$FE0E Break Status and Control Register (BRKSCR) \$FE0F Reserved \$FF10 Monitor ROM 2 448 Bytes \$FFD0 \$FLASH Vectors 48 Bytes	\$FE04	Interrupt Status Register 1 (INT1)
\$FE07 Reserved \$FE08 FLASH Control Register (FLCR) \$FE09 FLASH Block Protect Register (FLBPR) \$FE0A Reserved \$FE0B Reserved \$FE0C Break Address Register High (BRKH) \$FE0D Break Address Register Low (BRKL) \$FE0E Break Status and Control Register (BRKSCR) \$FE0F Reserved \$FE10 Monitor ROM 2 448 Bytes \$FFD0 ↓ FLASH Vectors 48 Bytes	\$FE05	Interrupt Status Register 2 (INT2)
\$FE08 \$FLASH Control Register (FLCR) \$FE09 \$FLASH Block Protect Register (FLBPR) \$FE0A \$Reserved \$FE0B \$Reserved \$FE0C Break Address Register High (BRKH) \$FE0D \$FE0D Break Status and Control Register (BRKSCR) \$FE0F \$Reserved \$FE10 ↓ \$FFCF \$FFCF \$FFD0 ↓ \$FLASH Vectors ### Address ###	\$FE06	Reserved
\$FE09 \$FLASH Block Protect Register (FLBPR) \$FE0A \$Reserved \$FE0B Reserved \$FE0C Break Address Register High (BRKH) \$FE0D Break Address Register Low (BRKL) \$FE0E Break Status and Control Register (BRKSCR) \$FE0F Reserved \$FE10 \$FFCF \$FFCF \$FFCF \$FFD0 \$FLASH Vectors 48 Bytes	\$FE07	Reserved
\$FE0A Reserved \$FE0B Reserved \$FE0C Break Address Register High (BRKH) \$FE0D Break Address Register Low (BRKL) \$FE0E Break Status and Control Register (BRKSCR) \$FE0F Reserved \$FE10 Monitor ROM 2 448 Bytes \$FFD0 \$FLASH Vectors 48 Bytes	\$FE08	FLASH Control Register (FLCR)
\$FE0B Reserved \$FE0C Break Address Register High (BRKH) \$FE0D Break Address Register Low (BRKL) \$FE0E Break Status and Control Register (BRKSCR) \$FE0F Reserved \$FE10 Monitor ROM 2 448 Bytes \$FFD0 \$FROM A Bytes	\$FE09	FLASH Block Protect Register (FLBPR)
\$FE0C Break Address Register High (BRKH) \$FE0D Break Address Register Low (BRKL) \$FE0E Break Status and Control Register (BRKSCR) \$FE0F Reserved \$FE10 ↓ \$FFCF Monitor ROM 2 448 Bytes \$FFD0 ↓ \$FFD0 ↓ \$FED0 \$FLASH Vectors 48 Bytes	\$FE0A	Reserved
\$FE0D Break Address Register Low (BRKL) \$FE0E Break Status and Control Register (BRKSCR) \$FE0F Reserved \$FE10 Monitor ROM 2 448 Bytes \$FFCF \$FFD0 \$FLASH Vectors 48 Bytes	\$FE0B	Reserved
\$FE0E Break Status and Control Register (BRKSCR) \$FE0F Reserved \$FE10 Monitor ROM 2 448 Bytes \$FFCF \$FFD0 \$FLASH Vectors 48 Bytes	\$FE0C	Break Address Register High (BRKH)
\$FE0F Reserved \$FE10 Monitor ROM 2 \$FFCF 448 Bytes \$FFD0 \$\int \text{PLASH Vectors} \text{48 Bytes}	\$FE0D	Break Address Register Low (BRKL)
\$FE10	\$FE0E	Break Status and Control Register (BRKSCR)
\$FFCF \$FFD0 \$FLASH Vectors 48 Bytes	\$FE0F	Reserved
\$FFCF 448 Bytes \$FFD0 \$FLASH Vectors 48 Bytes	\$FE10	Monitor ROM 2
FLASH Vectors 48 Bytes	↓ \$FFCF	
↓ 48 Rytes	\$FFD0	FLASH Vectors
	↓ \$FFFF	

Figure 4. MC68HC908JB12 Memory Map

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Pullup on PTE3/D+ and PTE4/D- Pins

On the MC68HC908JB12, control over the pullup devices on PTE3/D+ and PTE4/D- pins are shown in **Table 2**.

Table 2. Pullup Control on PTE3/D+ and PTE4/D- Pins

PULLEN (\$001A)	USBEN (\$0038)	PTExP (\$001D)	PTE4IE (\$001C)	PTE3/D+ pin	PTE4/D- pin
0	0	0	0	_	_
0	0	1	0	5 k Ω pullup to V $_{DD}$	5 k $Ω$ pullup to V_{DD}
0	0	0	1	_	5 k Ω pullup to V _{DD} $^{(1)}$
0	0	1	1	5 k Ω pullup to V _{DD}	5 k Ω pullup to V _{DD} ⁽¹⁾
0	1	Х	Х	_	_
1	1	Х	Х	_	1.5k Ω pullup to V _{REG}
1	0	Х	0	_	1.5k $Ω$ pullup to V_{REG}
1	0	Х	1	Do not set this	configuration.

^{1.} External interrupt function is also enabled on PTE4/D- pin.

Electrical Specifications

Electrical specifications for the MC68HC908JB16 apply to the MC68HC908JB12, except for the USB reset timing:

Rue State	Signaling Levels			
Bus State Transmit		Receive		
Reset	NA	D+ and D- < V_{IL} (max) for \geq 8 μ s (MC68HC908JB16) D+ and D- < V_{IL} (max) for \geq 125 μ s (MC68HC908JB12)		

Order Numbers

These are MC order numbers for MC68HC908JB12.

Table 3. MC68HC908JB12 Order Numbers

MC Order Number	Package	Operating Temperature Range
MC68HC908JB12JDW	20-pin SOIC	0 °C to +70 °C
MC68HC908JB12DW	28-pin SOIC	0 °C to +70 °C

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