

## 1 Introduction

This document describes the evaluation boards for the HC08-Family, EB08\_AZ, EB08\_AB EB08\_GP, EB08\_JB und EB08\_JL.

We designed the evaluation boards and starterkits for quick and easy software development or testing for each special controller. You could also use them for quick design of hardware prototypes e.g. breadboard construction without the need of special SMD boards. The Monitor-Mode-Interface provides the ability of software debugging or In-Circuit-Programming of the Controllers Flash Memory.

Photo

Main specifications:

- Monitor-Mode-Interface for Flash-Programming and debugging
- Dimensions ca. 52 x 57,4mm
- Uniform pinout of all boards for easy fit on test hardware or prototypes (2,54mm / 0,1" grid)
- We used special long Pinheads for easy connection of e.g. oscilloscope, logic analyser or test hardware on each side of the board
- Oscillators and quartz crystals in different structural shapes could be used
- You could optional assemble: voltage regulator, 2 LEDs , CAN-Transceiver (EB08\_AZ only)
- Reset-switch

## 2 Variations and supported controller types

The basis PCB is available in variations. Each variation supports several types of controllers Both PCB provide two 32pin connectors. These connectors have a compatible pin assignment at least for the IRQ, the Reset and the supply voltage pins.

So you can use the base PCB independent from the mounted controller type in different target hardware circuits. So small controllers could be substituted by bigger ones for debugging or test purposes. But the port pins pin assignment may vary in dependence of the used controller.

Name of Eval-Board	Controller	Package	Name of base PCB	Optional hardware accessory on PCB
EB08_AZ EB08_AZA EB08_AB EB08_GP	68HC908AZ60 MFU, CFU 68HC908AZ60A MFU, CFU 68HC908AB32 MFU, CFU 68HC908GP32 CFB	QFP64 QFP64 QFP64 QFP44	<b>EB08_AZ_GP</b> (described in EB08_AZ_GP. Doc document)	CAN-Transceiver 82C250 or 82C251 5V-voltage regulator TLE4269 2 LED at Ports
EB08_JB20 EB08_JB28 EB08_JB44 EB08_JL	68HC908JB8JDW 68HC908JB8ADW 68HC908JB8FB 68H(R)C908JL3MDW, CDW	SOIC20 SOIC28 QFP44 SOIC28	<b>EB08_JB_JL</b> (described in this document)	5V-voltage regulator TLE4269 2 LED at Ports

## 3 Adaptation

### 3.1 Monitormode-Entry-Conditions

You could look at the Motorola datasheets for the monitormode entry conditions. These conditions vary by the controller type. All levels are generated by resistors, so the pins could be used as an output by the application. If you use the pins as input take care that the level in reset state consists to the monitor mode conditions.

JP1 sets the baud rate. The processor pin PTA, PTB3 or PTC3 (depends on the  $\mu$ C type) is connected to GND or VDD.

JP1 connects	1-2	2-3
Level	VDD	GND

### 3.2 $\mu$ C-Clock-Generator

The  $\mu$ C clock could be generated by an oscillator in standard 14pin (QG1) or 8pin (QG2) shape, or by a quartz (Q1). All Clock generators are pluggable. For usage of the oscillator you have to connect two pins of the quartz socket (X6) e.g. by a small wire. (for details look place plan TOP)

### 3.3 Reset

If you use the MON-IF08B (has to be configured correctly) the RST/pin of the  $\mu$ C could be switched. So the PC software could generate a reset. Therefore the jumper SJ2 has to be closed. C7 (simple POR-Delay) should not be applied, if an external circuit or the onboard voltage regulator controls the RST/-Pin.

### 3.4 Different $\mu$ C-Types

To set correct monitormode entry conditions and supply voltages you have to mount different resistors and to set jumpers for each  $\mu$ C type.

	EB08_AZ_GP		EB08_JB_JL			
UC-Typ	'AZ60, 'AB60 QFP64	'GP32 QFP44	'JB8JDW SOIC20	'JB8ADW SOIC28	'JB8FB QFP44	'JL3MDW SOIC28
Jumper		SJ1	SJ7			
	mount		mount			
Resist- ors	R3	R8	R9, R10 R12	R9, R10 R12	R9, R10 R12	R2, R8 R4
Capacit- ors	C12		C8 C3	C8 C3	C8 C3	
	Don't mount		Don't mount			
Resist- ors	R8	R3	R2, R8 R4	R2, R8 R4	R2, R8 R4	R9, R10 R12
Capacit- ors		C12				C8 C3

## 4 Optional parts mounting

### 4.1 LEDs

You could mount 2 pieces 3mm low current LEDs, to have a visual control for testing purposes. The LEDs are connected via resistors (1kOhm) with their anode to the ports. The cathode is connected to GND. The cathode is marked with a "K" on the PCB.

$\mu$ C-type	'AZ60 QFP64	'AB60 QFP64	'GP32 QFP44	'JB8JDW SOIC20	'JB8ADW SOIC28	'JB8FB QFP44	'JL3MDW SOIC28
LED D2	PTH1	PTH1	PTA2	PTD0	PTD0	PTD0	PTA2
LED D3	PTD4	PTD4	PTA3	X2-16	X2-16	X2-16	X2-16

On the EB08\_JB\_JL you could use a small wire to connect LED D3 to a user defined port.

### 4.2 CAN-Transceiver

You could mount a CAN transceiver 82C250 or ,251' from Philips or a LT1796 at the IC1 position. The resistor R4 sets the rise time of the CAN signals. Capacitor C3 filters the supply voltage. The CAN bus has to be connected to X5.

### 4.3 Voltage regulator

You could mount an Infineon TLE4269G at the position of IC13. To use the IC's reset generator you have to close SJ2.

The non regulated supply voltage 5,3V to ca. 30V (depends on the current consumption because of the maximum thermal dissipation loss) has to be connected to X4. D1 protects the board against wrong polarity of the supply voltage. Please choose the electrolytic capacitor C4s voltage according to the maximum supply voltage.

## 5 Precautions

MOS devices are in principle sensitive to electrostatic discharge. Be sure to perform a potential equalisation before connecting the MON-IF08B to the target circuit. This protects the target controller from damage.

The PC and the power supply of the target circuit have to fulfil the requirements of a SELV-circuit described in EN60950.

The allowed temperature range is 0..50°C.

## 6 Pinout

X3 -Monitor Mode Interface		
10pin Pin No.	6pin Pin No.	Bedeutung
1		NC
2		NC
3	1	µC-RxD (optional)
4	2	µC-TxD (optional)
5	3	GND
6	4	+5V
7	5	HC08_IRQ
8	6	HC08_PTA0
9		
10		Relay coil or reset

The 6/10pin connector provides compatible in pin assignment to the 6pin target connector of the PGMR08 and to the 10pin connector of MON-IF08B or MON\_IF08P

NC: not connected

Top view of the according pinheader, pin assignment / pin arrangement

K		
5	3	1
6	4	2

K				
9	7	5	3	1
10	8	6	4	2

K: mechanical coding

Pin 1 is marked by an arrow at the connector

### 6.1 Pin assignment X1 und X2

X1	PIN-Nr	JB8-44	JB8-28	JB8-20	JL3	X2	PIN-Nr	JB8-44	JB8-28	JB8-20	JL3
X1-1	1	NC				X2-1	33	NC			
X1-2	2	IRQ/	IRQ/	IRQ/	IRQ/	X2-2	34	NC			
X1-3	3	RST/	RST/	RST/	RST/	X2-3	35	NC			
X1-4	4	VREG	VREG	VREG	PTA1	X2-4	36	NC			
X1-5	5				PTA0	X2-5	37	PTA6	PTA5	IRQ/	
X1-6	6	NC				X2-6	38	PTA5	PTA5	PTA7	
X1-7	7				PTD5	X2-7	39	PTA4	PTA4	PTA6	PTD1
X1-8	8	PTD0	PTD0	PTD0	PTA2	X2-8	40	PTE2	PTE2	PTA5	
X1-9	9				PTA5	X2-9	41	PTE0	PTE0	PTA4	
X1-10	10				PTD4	X2-10	42	PTC4			
X1-11	11	PTD1	PTD1	PTE1/TCH0	PTA3	X2-11	43	PTC5			
X1-12	12	PTD2	PTD2	PTE3/D+	PTB7	X2-12	44	PTC6			
X1-13	13	PTD3	PTD3	PTE4/D-	PTB6	X2-13	45	PTC7			
X1-14	14	PTD4	PTD4	PTC0	PTB5	X2-14	46	PTA3	PTA3	PTA3	PTD3
X1-15	15	PTE1	PTE1/TCH0		PTD7	X2-15	47	PTA2	PTA2	PTA2	PTA4
X1-16	16	NC				X2-16	48				
X1-17	17	PTE3	PTE3/D+		PTD6	X2-17	49	PTA1	PTA1	PTA1	PTD2
X1-18	18	PTE4	PTE4/D-		PTB3	X2-18	50	NC			
X1-19	19	PTC0	PTC0			X2-19	51	PTB7			
X1-20	20	PTC1			PTB2	X2-20	52	PTB6			
X1-21	21	VSS (GND)	VSS (GND)	VSS (GND)	VSS (GND)	X2-21	53	NC			
X1-22	22	VDD	VDD	VDD	VDD	X2-22	54	PTB5			
X1-23	23	PTC2				X2-23	55	PTB4			
X1-24	24	PTC3			PTB1	X2-24	56	PTB3			
X1-25	25	NC				X2-25	57	NC			
X1-26	26	PTA0	PTA0	PTA0	PTB0	X2-26	58	NC			
X1-27	27	NC				X2-27	59	NC			
X1-28	28	NC				X2-28	60	NC			
X1-29	29	PTD7				X2-29	61	PTB2			
X1-30	30	PTD6	PTD6			X2-30	62	PTB1			
X1-31	31	PTD5	PTD5		PTB4	X2-31	63	PTB0			
X1-32	32	PTA7	PTA7		PTD0	X2-32	64	NC			

## 7 Package content

Evaluationboard EB08\_xx, order by exact µC type and needed options. Normal delivery is with mounted µC and LED's but without voltage regulator. You could also order only the PCB without any mounted devices.

## 8 Contact

If you have questions about the product or application, please feel free to contact us.

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