

IDB-HC08GP Evaluation Board For Freescale MC68HC908GP

User's Manual (Rev. 2.0)

1. Introduction

Overview

The IDB-HC08GP Evaluation Board demonstrates the capabilities of the 44-pin MC68HC908GP devices. The IDB-HC08GP Evaluation Board can be used as a standalone application or with an emulator system, such as inDART-HC08, through a MON08-compatible connection.

Board Features

The IDB-HC08GP Evaluation Board has the following hardware features:

1. An MC68HC908GP32 microcontroller (in QFP44 package, already programmed with a demo application—in addition, you can also use any of the MC68HC908GP/GT family devices);
2. ZIF socket for the microcontroller;
3. A standard MON08 connector;
4. Eight jumpers to connect/disconnect each of the eight DIP-switches to/from their respective Port D pins;
5. Eight general-purpose DIP-switched connected to Port D;



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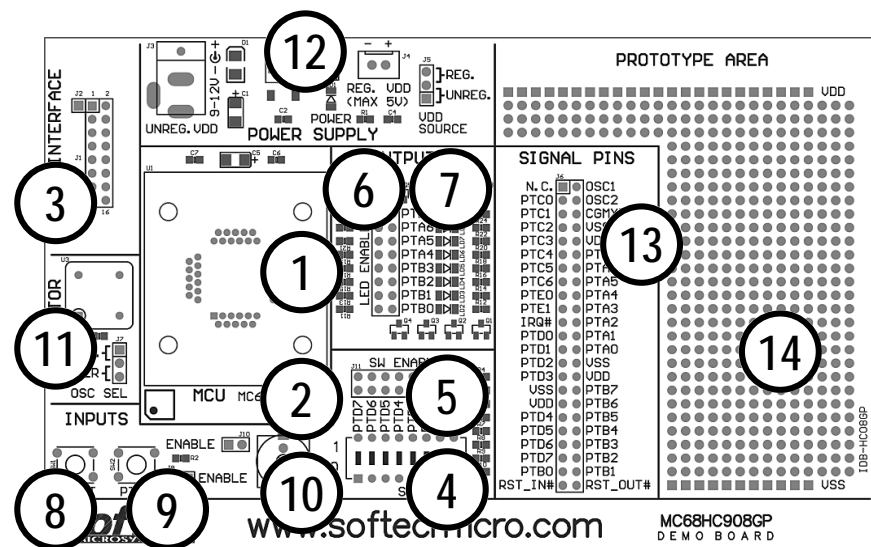
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6. Eight jumpers to connect/disconnect each of the eight LEDs to/from their respective Port A and Port B pins;
7. Eight high-efficiency (low-current) LEDs connected to Port A and Port B;
8. A push-button switch connected to RESET;
9. A push-button switch, together with a jumper to connect/disconnect it to/from PTB5;
10. A potentiometer, together with a jumper to connect/disconnect it to/from PTB4;
11. A 16-MHz oscillator, together with a jumper to connect/disconnect it from the microcontroller's OSC1 pin;
12. A connector for a 9-12-V, 200-mA (unregulated) power supply and an auxiliary power supply connector for a 5-V (max., regulated), together with a jumper to select the power supply source;
13. A connector area to access the I/O pins of the microcontroller for expansion prototyping;
14. A prototyping area.



The IDB-HC08GP Demo Board

Supported Devices

The IDB-HC08GP Evaluation Board supports the following devices:

- MC68HC908GP32;
- MC68HC908GT8;
- MC68HC908GT16;
- And any future MC68HC908GP/GT family pin-to-pin compatible device.

Recommended Reading

Freescale MCU CD-ROM or individual datasheet;
 Freescale CPU08 Central Processor Unit Reference Manual;
 inDART-HC08 User's Manual.

2. Getting Started

Overview

The IDB-HC08GP Evaluation Board may be used as a standalone application or with a MON08-based emulator/programmer (host mode).

Standalone Mode

The IDB-HC08GP Evaluation Board comes with the microcontroller pre-programmed with a sample application. When working in standalone mode, the sample application configures the A/D peripheral to convert on the A/D channel connected to the potentiometer and displays the results on the LEDs. By pressing the PTB5 push button, the DIP-switches status is displayed on the LEDs instead.

In order for the IDB-HC08GP Evaluation Board to work in standalone mode, the MON08 connector's pins must be jumpered as show below (factory setting).



MON08 Connector Jumpered for Standalone Mode Operation

Additionally, you must verify that the board's other jumpers are set correctly.

- Make sure that both the "OSC SEL" (J7) jumper selects the "OSC" position. This is needed to enable the on-board 16-MHz oscillator.
- Make sure that all of the "LED ENABLE" jumpers (J8) and the "POTENTIOMETER ENABLE" jumper (J10) are inserted.
- Make sure that the pre-programmed sample device is in the appropriate socket on the board. Finally, power up the board. The IDB-HC08GP Evaluation Board can be powered either via the "UNREG. VDD" connector (J3) or the "REG. VDD" connector (J4).

The "UNREG. VDD" connector accepts 9-12 V DC, 200-mA wall plug-in power supply with a 2.1 mm pin and sleeve plug with positive in the center and sleeve as ground. When powering the board through this connector, make sure the "VDD SOURCE" connector (J5) selects the "UNREG." Position. The "UNREG. VDD" voltage is internally regulated to 5 V DC.

The "REG. VDD" connector accepts 5 V DC (max.). When powering the board through this connector, make sure the "VDD SOURCE" connector (J5) selects the "REG." Position. The "REG. VDD" voltage directly powers the microcontroller and the rest of the board.

Upon powering up the board, the green "POWER" LED turns on. By rotating the potentiometer, you affect the results of the A/D conversion, and the value of each conversion is displayed (in a linear bar fashion) on the LEDs.

Host Mode

The IDB-HC08GP Evaluation Board can be used in conjunction with a MON08-based emulator/programmer, such as SofTec Microsystems' inDART-HC08 In-Circuit Debugger/Programmer or a Freescale development tool.

If you use the evaluation board with SofTec Microsystems' inDART-HC08, a sample application similar to that described in the previous section can be executed in "Host" mode, where the program execution is controlled by the host PC. You can use the PC, additionally, to debug the application by, for example, execute the program step by step and watching how the microcontroller registers vary, by using the Metrowerks' CodeWarrior HC08 IDE provided with inDART-HC08. The example is available both in Assembly and in C language. Please refer to the inDART-HC08 user's manual for a step-by-step tutorial.

In order to work with an emulator/programmer, the jumpers in the MON08 connector must be removed, and the MON08 cable of the emulator/programmer must be connected to the evaluation board's MON08 connector (J1) connector, taking care of the proper polarity. The J2 connector is not used in this mode.

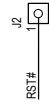
3. MON08 Connections (J1 Connector)

Pin #	Pin Name	Description
1	RST_OUT#	Reset signal to target system: GND or open drain output reflecting the state of the MCU RST# and RST_IN# signals.
2	GND	System ground.
3	RST_IN#	Reset signal from target system: GND to V_{DD} input to control the state of the MCU RST# and RST_OUT# signals.
4	RST#	MCU reset; held at V_{PP} out of reset. No other target-system logic should be tied to this signal.
5	TGT_IRQ#	Interrupt signal from target system: GND to V_{DD} input to control the state of the MCU IRQ# signal.
6	IRQ#	MCU interrupt; held at V_{PP} when the TGT_IRQ# signal is not asserted.
7	TGT_PTA0	Port A, bit 0; reserved MCU connection (unavailable to application).
8	PTA0	Port A, bit 0; MON08 single-wire communication.
9	TGT_PTA7	Port A, bit 7.
10	PTA7	Port A, bit 7; grounded during reset.
11	TGT_PTC0	Port C, bit 0.
12	PTC0	Port C, bit 0; held at V_{DD} during reset.
13	TGT_PTC1	Port C, bit 1.
14	PTC1	Port C, bit 1; grounded during reset.
15	TGT_PTC3	Port C, bit 3.
16	PTC3	Port C, bit 3; held at ground or V_{DD} during reset, depending on the "Frequency Divider" parameter (see inDART-HC08 User's Manual).

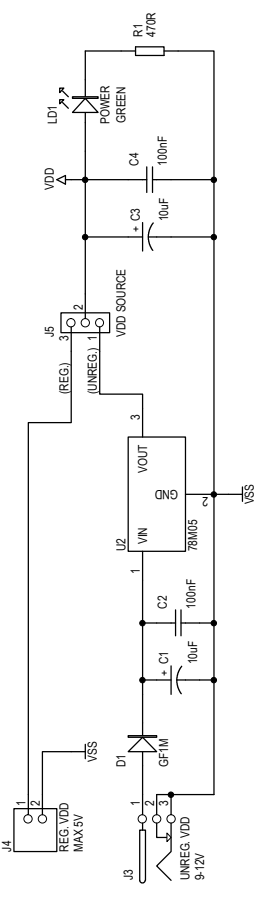
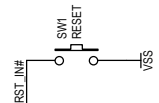
MON08 Signals

(N.C.)	J6	OSC1
(PTC0)	1	OSC2
(PTC1)	2	CGM2FC
(PTC2)	3	VSS
(PTC3)	4	VDD
	5	TGT_PTA7 (PTA7)
	6	PTA6
	7	PTA5
	8	PTA4
	9	PTA3
	10	PTA2
	11	PTA1
	12	TGT_PTA0 (PTA0)
	13	VSS
	14	VDD
	15	PTB7
	16	PTB6
	17	PTB5
	18	PTB4
	19	PTB3
	20	PTB2
	21	PTB1
	22	VSS
	23	VDD
	24	TGT_PTB0 (PTB0)
	25	PTB7
	26	PTB6
	27	PTB5
	28	PTB4
	29	PTB3
	30	PTB2
	31	PTB1
	32	VSS
	33	VDD
	34	PTB7
	35	PTB6
	36	PTB5
	37	PTB4
	38	PTB3
	39	PTB2
	40	PTB1
	41	VSS
	42	VDD
	43	PTB7
	44	PTB6
	45	PTB5
	46	PTB4
	47	PTB3
	48	PTB2
	49	PTB1
	50	RST_OUT#

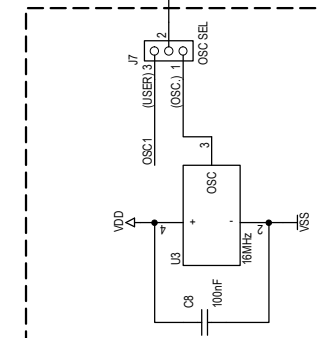
SIGNAL PINS



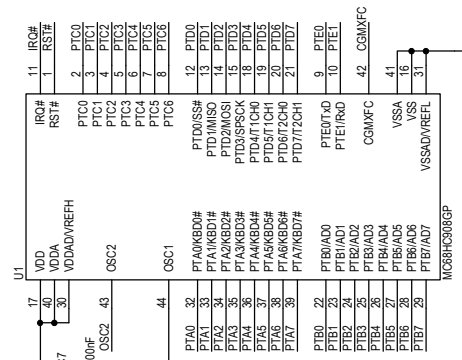
MON08 INTERFACE



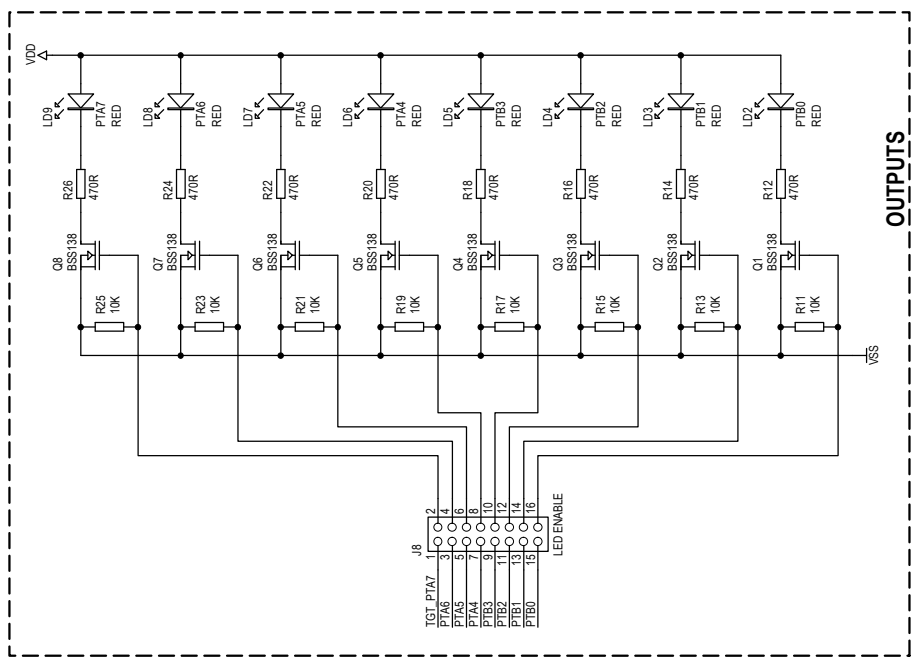
POWER SUPPLY



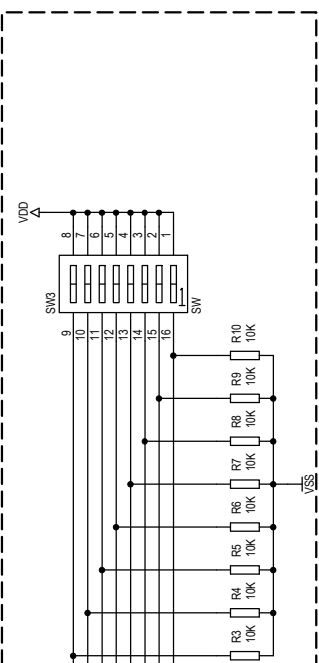
OSCILLATOR



MCU



OUTPUTS



INPUTS