

IDB-HCS08RG Evaluation Board For Freescale MC9S08RG60

User's Manual (Rev. 2.0)

1. Introduction

Overview

The IDB-HCS08RG Evaluation Board demonstrates the capabilities of the 44-pin MC9S08RG60 device. The IDB-HCS08RG Evaluation Board can be used as a standalone application or with an emulator system, such as inDART-HCS08, through a standard BDM connection.

Board Features

The IDB-HCS08RG Evaluation Board has the following hardware features:

1. A "MCU" section containing a MC9S08RG60 microcontroller (in LQFP44 package).
2. An "OSCILLATOR" section containing a 16-MHz oscillator, together with two jumpers for the oscillator source selection.
3. A "BDM" section, containing a standard BDM connector for in-circuit debugging/programming.



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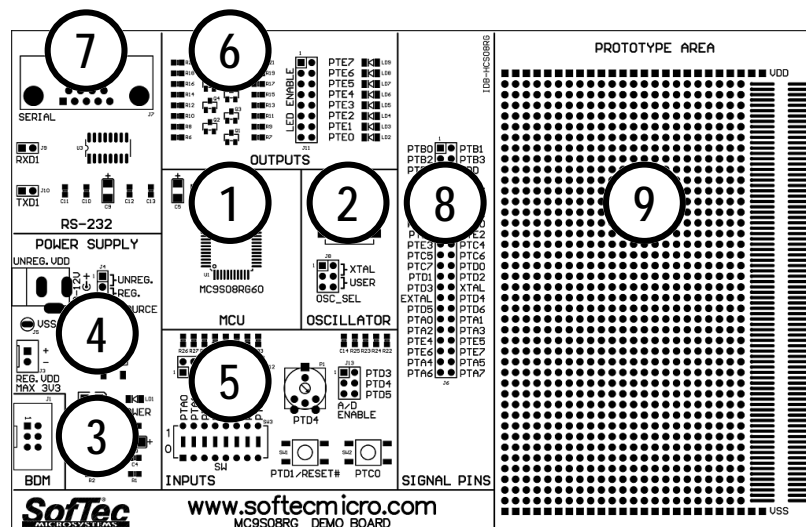
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4. A "POWER SUPPLY" section containing a connector for a 9-12 V, 200 mA (unregulated) power supply plus an auxiliary connector for a 3.3 V (max., regulated) power supply, together with a jumper to select the power supply source;
5. An "INPUTS" section containing:
 - Two push-buttons, connected to PTD1/RESET and PTC0;
 - Eight general-purpose DIP-switches connected to Port A;
 - Eight jumpers to connect/disconnect each of the eight DIP-switches to/from their respective Port A pins;
 - A potentiometer, together with three jumpers to connect/disconnect it to/from PTD3, PTD4, PTD5. All three ports are needed to carry out analog to digital conversions, since the conversion is based on a Sigma-Delta method (for more information, see Freescale Application Note AN2688/D).
6. An "OUTPUTS" section containing eight high-efficiency (low-current) LEDs connected to Port E, together with eight jumpers to connect/disconnect each of the eight LEDs to/from their respective Port E pins.
7. An "RS-232" section providing a D-SUB 9-pin female connector together with two jumpers to connect/disconnect the RXD1 and TXD1 pins to/from the RS-232 circuitry;
8. A "SIGNAL PINS" section containing a connector area to access the I/O pins of the microcontroller for expansion prototyping.
9. A "PROTOTYPE AREA" section.



The IDB-HCS08RG Demo Board

Recommended Reading

Freescale MC9S08RG datasheet;
 Freescale HCS08 Family Reference Manual;
 inDART-HCS08 User's Manual.

2. Getting Started

Overview

The IDB-HCS08RG Evaluation Board may be used as a standalone application or with a BDM-based emulator/programmer (host mode).

Powering Up the Board

The IDB-HCS08RG Evaluation Board can be powered either via the "UNREG. VDD" connector (J2) or the "REG. VDD" connector (J3).

- 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" jumper (J4) selects the "UNREG." position. The "UNREG. VDD" voltage is internally regulated to 3.3 V DC.
- The "REG. VDD" connector accepts 3.3 V DC (max.). When powering the board through this connector, make sure the "VDD SOURCE" jumper (J4) selects the "REG." position. The "REG. VDD" voltage directly powers the microcontroller and the rest of the board. The "REG. VDD" connector has been designed to be used together with inDART-HCS08.

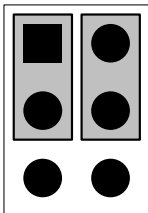
Running the Example

The IDB-HCS08RG Evaluation Board can be used in conjunction with a BDM-based emulator/programmer, such as SofTec Microsystems inDART-HCS08 In-Circuit Debugger/Programmer.

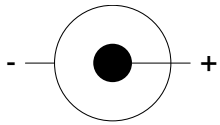
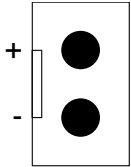
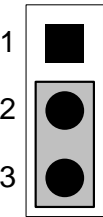
If you use the evaluation board with SofTec Microsystems inDART-HCS08, a sample application is available, where the program execution is controlled by the host PC. You can use the PC, additionally, to debug the application by, for example, execute the program step by step and watching how the microcontroller registers vary, by using the Metrowerks CodeWarrior HC(S)08 IDE provided with inDART-HCS08. Please refer to the inDART-HCS08 user's manual for a step-by-step tutorial.

3. Hardware Reference

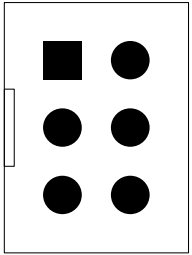
"OSCILLATOR" Section

	<p>J8 – OSC_SEL</p> <p>1-3, 2-4 On-board oscillator (default) 3-5, 4-6 User-provided clock</p>
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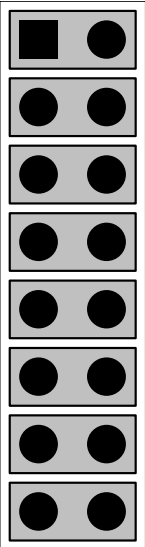
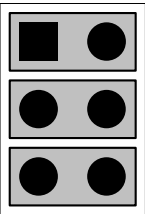
“POWER SUPPLY” Section

	<p>J2 – UNREG. VDD</p> <p>Input: 9-12 V DC (200 mA max.) Internally regulated to 3.3 V DC.</p>
	<p>J3 – REG. VDD</p> <p>Input: 3.3 V DC (max.) No internal regulator used.</p>
	<p>J4 – VDD SOURCE</p> <p>1-2 Use the “UNREG. VDD” connector (J2) 2-3 Use the “REG. VDD” connector (J3) (default)</p>

“BDM” Section

	<p>J1 – STANDARD BDM CONNECTOR</p> <p>1 BKGD 2 VSS 3 N.C. 4 RESET# 5 N.C. 6 VDD</p>
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“INPUTS” Section

	<p>J12 – SW ENABLE</p> <p>Each jumper, when installed, connects a DIP-switch to the respective PTAx pin (default).</p> <p>When a jumper is not installed, the respective PTAx pin is N.C. (available for user applications on the “SIGNAL PINS” section)</p>
	<p>J13 – A/D ENABLE</p> <p>All Jumpers Installed: Potentiometer connected to PTD3, PTD4 and PTD5 pins (default) Note: all three jumpers must be installed to enable A/D conversion.</p> <p>No Jumpers Installed: PTD3, PTD4 and PTD5 pins N.C. (available for user applications on the “SIGNAL PINS” section)</p>

“OUTPUTS” Section

	<p>J11 – LED ENABLE</p> <p>Each jumper, when installed, connects a LED to the respective PTE_x pin (default).</p> <p>When a jumper is not installed, the respective PTE_x pin is N.C. (available for user applications on the “SIGNAL PINS” section)</p>
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“RS-232” Section

	<p>J9 – RXD1</p> <p>Installed: RXD1 pin used by RS-232 circuitry (default)</p> <p>Not Installed: RXD1 pin N.C. (user)</p>																		
	<p>J10 – TXD1</p> <p>Installed: TXD1 pin used by RS-232 circuitry (default)</p> <p>Not Installed: TXD1 pin N.C. (user)</p>																		
	<p>J7 – RS-232 CONNECTOR</p> <table> <tr><td>1</td><td>N.C.</td></tr> <tr><td>2</td><td>TX</td></tr> <tr><td>3</td><td>RX</td></tr> <tr><td>4</td><td>N.C.</td></tr> <tr><td>5</td><td>VSS</td></tr> <tr><td>6</td><td>N.C.</td></tr> <tr><td>7</td><td>N.C.</td></tr> <tr><td>8</td><td>N.C.</td></tr> <tr><td>9</td><td>N.C.</td></tr> </table>	1	N.C.	2	TX	3	RX	4	N.C.	5	VSS	6	N.C.	7	N.C.	8	N.C.	9	N.C.
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