R8C/M12A Group

Renesas Promotion Board Sample Code

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Introduction

Renesas Promotion Boards (PRB) are supplied as an evaluation platform for the selected microcontroller. The kit includes an evaluation board including On Chip Debugger and a set of peripheral sample code. This peripheral sample code is supplied as a Hi-performance Embedded Workshop (HEW) workspace with this document. The RPB can be purchased with the following Part Number R0K502M12S000BE.

Target Device

R8C/M12A Group

Contents

1. Opening the sample code workspace

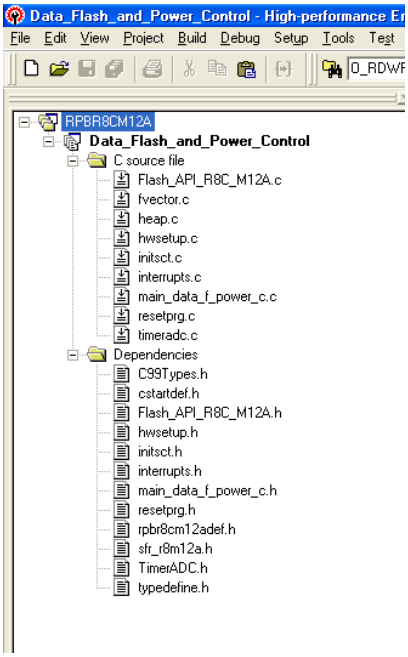
The sample code is supplied as a Hi-performance Embedded Workshop (HEW) workspace. This workspace should be copied to a suitable folder on your PC. The default location that HEW will look for workspace files is c:\workspace.

Once copied to a suitable location the workspace can be opened by double clicking the file “RPBR8CM12A.hws” or within HEW from the File | Open Workspace menu item.

2. Loading the selected sample code project

Within the workspace there is a single embedded project. This project contains the source files designed to demonstrate Data Flash and power control on the device.

Once the workspace is loaded into HEW the required sample project must be loaded before you can be open the source files. From the Project | Set current project menu item select the required project name.



Project navigator

3. Opening sample code source files

Once the project is loaded the source code and all dependant files can be opened in the editor by double clicking the file in the workspace window.

4. Source code functionality

Each source code project is specifically written to run on the appropriate RPB. However this source code can be useful as an example of peripheral initialization even without the RPB.

The sample project contains a C source file that includes the function main(), that is main_data_f_power.c This source file contains a comment block that describes the function of the sample code.

5. Appendix

Example of comment block with code functionality

```
/***********************************************************************
* Copyright (C) 2010 Renesas Electronics Corporation. All rights reserved.   */
/***********************************************************************
* File Name     : main_data_f_power_c.c
* Version       : 1.00
* Device        : R5F2M122ANSP
* Tool Chain    : R8C Family C Compiler
* H/W Platform  : RPBR8CM12A
* Description   : Demonstration of the on chip data flash and Power control by
*                 reading/writing the ADC value to/from data flash and step
*                 through each power mode.
*
* Operation     :  1. Build this application and download it to target using
*                  'Program Flash' option in the emultor setting dialog box.
*                  2. To run the sample code make sure SW2 setting are as follow,
*                  SW2 [1= ON, 2= OFF, 3= OFF, 4=OFF]
*                  3. After setting SW2 plug a USB cable into the USB connector
*                  to power up the board.
*                  4. After plugging the USB cable, Power LED will turn ON and the
*                  demo code will start running.
*                  5. Demo code will start with LED flashing. LED flash rate is
*                  controlled by the on board potentiometer (RV1) connected to
*                  analog to digital port pin of the microcontroller. Adjust RV1
*                  to change the flash rate, at the same time the A/D converter
*                  values are written into the Data Flash to record the LED flash
*                  pattern. After approximately 15 seconds the LED flashing will
*                  stop.
*                  6. Press SW1 to replay LED flash pattern recorded earlier based
*                  on the A/D converter values stored in the Data flash. This
*                  will again take approximately 15 seconds to replay.
*                  7. Once replay is finished demo code will demonstrate the power
*                  modes of the device. LED1 will turn ON after finishing the
*                  replay which means microcontroller is in standard mode. The
*                  power consumption in standard mode is 3mA - 7mA*.
*                  8. Press SW1 to change the mode to wait mode. LED1 will turn ON
*                  and the power consumption in wait mode is 15uA - 100uA*.
*                  9. Press SW1 again to change the mode to stop mode. LED2 will turn
*                  ON and power consumption in stop mode is 1uA - 4uA*.
*
*
*                  Note:
*                  Remove R22 from the board and connect ammeter across J3 to
*                  measure current.
*                  Do not execute the sample code in Debug mode because in debug
*                  mode High speed on chip oscillator is always running. Hence
*                  correct current readings cannot be measured. To measure correct
*                  current readings download the sample code to the MCU in using
*                  'Program Flash' option in the emulator setting dialog box when
*                  connecting.
*
***********************************************************************/
```

```
/***********************************************************************
* History      : 17.08.2010 Ver. 1.00 First Release
***********************************************************************/

DESCRIPTION        Sets up ADC Channel 0 in single operation mode, software
                   triggered. The code performs a single AD conversion.
Operation          1. Build this application and download it to the target. Press 'Reset Go'.
                   2. Press stop button (available on 'debug run' toolbar) after 5 seconds.
                   3. The result of the conversion can now be checked in global variable
                   ‘usADC_Result'. Same result can be examined on the debug LCD.
***********************************************************************/
```

6. Website and Support

Renesas Electronics Website
http://www.renesas.com/

Inquiries
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Revision Record

Rev.	Date	Description	
		Page	Summary
1.00	Mar 25, 2011	—	First edition issued

General Precautions in the Handling of MPU/MCU Products

The following usage notes are applicable to all MPU/MCU products from Renesas. For detailed usage notes on the products covered by this manual, refer to the relevant sections of the manual. If the descriptions under General Precautions in the Handling of MPU/MCU Products and in the body of the manual differ from each other, the description in the body of the manual takes precedence.

1. Handling of Unused Pins
   Handle unused pins in accord with the directions given under Handling of Unused Pins in the manual.
   — The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible. Unused pins should be handled as described under Handling of Unused Pins in the manual.
2. Processing at Power-on
   The state of the product is undefined at the moment when power is supplied.
   — The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the moment when power is supplied.
   In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the moment when power is supplied until the reset process is completed.
   In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the moment when power is supplied until the power reaches the level at which resetting has been specified.
3. Prohibition of Access to Reserved Addresses
   Access to reserved addresses is prohibited.
   — The reserved addresses are provided for the possible future expansion of functions. Do not access these addresses; the correct operation of LSI is not guaranteed if they are accessed.
4. Clock Signals
   After applying a reset, only release the reset line after the operating clock signal has become stable. When switching the clock signal during program execution, wait until the target clock signal has stabilized.
   — When the clock signal is generated with an external resonator (or from an external oscillator) during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Moreover, when switching to a clock signal produced with an external resonator (or by an external oscillator) while program execution is in progress, wait until the target clock signal is stable.
5. Differences between Products
   Before changing from one product to another, i.e. to one with a different type number, confirm that the change will not lead to problems.
   — The characteristics of MPU/MCU in the same group but having different type numbers may differ because of the differences in internal memory capacity and layout pattern. When changing to products of different type numbers, implement a system-evaluation test for each of the products.

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