CE215674 - FM0+ Unique ID

This application demonstrates the three different methods of reading the Unique ID (UID) from the device and compares the results. The green LED is used to indicate success/failure conditions.

Overview

The UID is read from the device using all the available PDL API functions. The returned values, in the form of a 2-member struct, a 64-bit variable, and two 32-bit variables, are compared against each other to show that they return the same data (only the representation is different). A GPIO is used to drive an LED that indicates failure conditions.

Requirements

Tool: PSoC Creator 4.0 and Peripheral Driver Library (PDL) 2.1

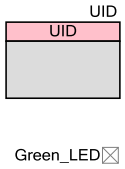
Programming Language: C (GCC 4.9.3)

Associated Parts: All S6E1 parts

Related Hardware: FM0-V48-S6E1A1 and FM0-64L-S6E1C3

Design

The schematic file includes the UID and a GPIO component, renamed as shown below.



The firmware performs following functions:

1. Initialize the LEDs (on)
2. Read the UID as a struct, two 32-bit values and a single 64-bit value
3. If the read fails, turn off the LED
4. If the 32-bit reads do not match the struct turn off the LED
5. If the 64-bit read does not match the 32-bit reads turn off the LED
6. If all reads match, light the LED to indicate success

Design Considerations

Pin Selection

The project includes control files to automatically place the LED IO onto the appropriate pin for the supported kit hardware. To change the pin selections, delete the control file or over-ride the control file selections in the Design Wide Resources Pin Editor.

PDL Installation

The project assumes that you have installed the PDL in the location specified in the **Project Management** panel of the **Tools** > **Options** dialog. If that location is incorrect you will see the build error “The given PDL path is invalid. Unable to find required PDSC file.” To correct this problem in a newly-created project, open the **Project** > **Properties** dialog and enter the correct path to the PDL. To avoid the problem in projects you create in the future, make sure you put the correct path in the **Tools** > **Options** dialog.

Hardware Setup

The LED GPIO is connected to a green LED.

Table 1 lists the pin connections required to use this code example on FM0+ kits.

Table 1. List of Pins

Pin	FM0-V48-S6E1A1	FM0-64L-S6E1C3
Green_LED:GPIO	P61	P3E

Components

Table 2 lists the PSoC Creator Components used in this example, as well as the hardware resources used by each.

Table 2. List of PSoC Creator Components

Component	Version	Hardware Resources
PDL_UID	1.0	Unique ID register
PDL_GPIO	1.0	GPIO pin

Parameter Settings

All the components use their default parameter settings. Only the component instance names have been changed for readability.

Operation

Barring an error while reading the UID, the application simply lights the LED to indicate success. You can use the debugger to step through all the comparisons and manually check the variables in the Watch window.

Related Documents

Table 3 lists relevant application notes, code examples, knowledge base articles, device datasheets, and Component datasheets.

Table 3. Related Documents

PSoC Creator Component Datasheets	
PDL_SWWDG	Supports watchdog interrupts, device reset, and window mode (right-click on the Component to access)
PDL_RESET	Enables determination of the reset cause (right-click on the Component to access)
PDL_GPIO	Supports firmware access to physical pins (right-click on the Component to access)
Device Documentation	
S6E1A	FM0+ S6E1A-Series 5 V Robust ARM® Cortex®-M0+ Microcontroller (MCU) Family
S6E1C	FM0+ S6E1C-Series Ultra Low Power ARM® Cortex®-M0+ Microcontroller (MCU) Family
Development Kit (DVK) Documentation	
FM0-V48-S6E1A1	ARM® Cortex®-M0+ FM0+ MCU Evaluation Board
FM0-64L-S6E1C3	ARM® Cortex®-M0+ MCU Starter Kit with USB and Digital Audio Interface

Document History

Document Title: CE215674 – FM0+ Unique ID

Document Number: 002-15674

Revision	ECN	Orig. of Change	Submission Date	Description of Change
**	5373342	YFS	09/17/16	New Code Example.
*A	5453225	YFS	09/28/16	Changed the workspace folder name. Moved the PDF file.
*B	5714338	YFS	4/26/17	Added search keyword so that user can quickly find Code Examples from the component instance popup menu. Updated logo and copyright date.
*C	5776656	YFS	6/16/17	Changed the search keyword (added in *B) so that it is hidden (does not clutter the Find Code example dialog).
*D	5987499	YFS	12/7/17	Removed S6E1B support.

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