

Please note that Cypress is an Infineon Technologies Company.

The document following this cover page is marked as “Cypress” document as this is the company that originally developed the product. Please note that Infineon will continue to offer the product to new and existing customers as part of the Infineon product portfolio.

Continuity of document content

The fact that Infineon offers the following product as part of the Infineon product portfolio does not lead to any changes to this document. Future revisions will occur when appropriate, and any changes will be set out on the document history page.

Continuity of ordering part numbers

Infineon continues to support existing part numbers. Please continue to use the ordering part numbers listed in the datasheet for ordering.

Objective

This code example demonstrates the functionality of the TCPWM Component in PWM mode to blink LEDs using PSoC® 4.

Requirements

Tool: PSoC Creator™ 4.3

Programming Language: C (Arm® GCC 5.4.1)

Associated Parts: All PSoC 4 parts

Related Hardware: CY8CKIT-040, CY8CKIT-041-41XX, CY8CKIT-042, CY8CKIT-042-BLE, CY8CKIT-043, CY8CKIT-044, CY8CKIT-046, CY8CKIT-145, CY8CKIT-147, CY8CKIT-149

Overview

This example (as shown in [AN79953](#)) blinks two LEDs using a TCPWM Component. The TCPWM is configured in PWM mode. The two complementary outputs of this PWM control the LEDs.

Hardware Setup

This example uses the kit's default configuration. See the kit guide to ensure that the kit is configured correctly.

Note: Kit guides are available at the [landing page](#) of the corresponding kit.

Software Setup

Ensure that you have all the software tools as mentioned in [Requirements](#) section installed.

Operation

1. Plug the kit board into your computer's USB port.
2. Use the **Find Code Example** dialog to search for and open code examples installed on disk with PSoC Creator, as well as download and install code examples from the Cypress web site. Do the following:
 - a. In PSoC Creator, select **Find Code Example...** on the Start page, or select **Code Example...** under the **File** menu.
 - b. Select the device family (any PSoC 4 family) in which you wish to use this example. In addition, if required, select a keyword from the **Filter by** pull-down menu or type the project name ("Getting Started with PSoC 4") or other words.
 - c. Select the project or workspace (*CE230991_Getting_Started_With_PSoC4*) from the list.
 - d. View the documentation and/or code for the project by clicking the appropriate tab, if desired.
 - e. Click either **Create Project** or **Create Workspace**, as appropriate. The New Project wizard opens to complete the project/workspace creation process. Click **Finish** to open the project.

Note: See the [PSoC Creator User guide](#) for more details.

3. Build the project and program it into the PSoC 4 device. Choose **Debug > Program**. For more information on device programming, see PSoC Creator Help.
4. Observe the LED1 and LED2 toggle at 50 percent duty cycle.

Note: CY8CKIT-043 and CY8CKIT-147 have only one LED connected to P1[6] and P0[2] respectively. If you are using CY8CKIT-043, you can connect an external LED to pin P0[2] and if you are using CY8CKIT-147, you can connect an external LED to pin P0[3]. See the "My First PSoC 4 Design" section in [AN79953](#) for more details about the operation.

Design and Implementation

See the “About the Design” section under the “My First PSoC 4 Design” chapter in [AN79953](#) for details about the design and implementation.

Components and Settings

The “Part 1: Create the Design” section under the “My First PSoC 4 Design” chapter in [AN79953](#) lists the PSoC Creator Components used in this example, how they are used in the design, and the non-default settings required so they function as intended. For information on the hardware resources used by a Component, see the Component datasheet.

Reusing This Example

This example is designed for the [supported kit\(s\)](#). To port the code example to a different device, in PSoC Creator, select **Project > Device Selector** and change to the target device. The pin assignments for the supported kits are provided in the “Pin Mapping Table across Pioneer Kits” and Pin Mapping Table across Prototyping Kits” tables in [AN79953](#).

For these kits, the project includes control files to automatically assign pins with respect to the kit hardware connections during the project build. To change the pin assignments, override the control file selections in the Pin Editor of the **Design Wide Resources** by selecting the new port or pin number.

This code example can be used with all devices in the PSoC 4 family.

Note: [CY8CKIT-043](#) requires manual assignment of pins.

Related Documents

For a comprehensive list of PSoC 4 resources, see [KBA86521](#) in the Cypress community.

Application Notes	
AN79953 - Getting Started with PSoC 4	Describes PSoC 4 devices and shows how to build the associated code example
PSoC Creator Component Datasheets	
TCPWM	A multifunctional Component that can implement the following functionalities: PWM, Timer/Counter, and Quadrature Decoder.
General Purpose Input/ Output (GPIO)	A multifunctional Component that allows hardware resources to connect to a physical port-pin and provides access to external signals through an appropriately configured physical I/O pin.
Device Documentation	
PSoC 4 Datasheets	PSoC 4 Technical Reference Manuals
Development Kit (DVK) Documentation	
PSoC 4 Kits	
Tool Documentation	
PSoC Creator	Go to the Downloads tab for Quick Start and User Guides

Document History

Document Title: CE230991 – Getting Started with PSoC 4

Document Number: 002-30991

Revision	ECN	Date	Description of Change
**	6962261	09/09/2020	New code example

Worldwide Sales and Design Support

Cypress maintains a worldwide network of offices, solution centers, manufacturer's representatives, and distributors. To find the office closest to you, visit us at [Cypress Locations](#).

Products

Arm® Cortex® Microcontrollers	cypress.com/arm
Automotive	cypress.com/automotive
Clocks & Buffers	cypress.com/clocks
Interface	cypress.com/interface
Internet of Things	cypress.com/iot
Memory	cypress.com/memory
Microcontrollers	cypress.com/mcu
PSoC	cypress.com/psoc
Power Management ICs	cypress.com/pmic
Touch Sensing	cypress.com/touch
USB Controllers	cypress.com/usb
Wireless Connectivity	cypress.com/wireless

PSoC® Solutions

[PSoC 1](#) | [PSoC 3](#) | [PSoC 4](#) | [PSoC 5LP](#) | [PSoC 6 MCU](#)

Cypress Developer Community

[Community](#) | [Projects](#) | [Videos](#) | [Blogs](#) | [Training](#) | [Components](#)

Technical Support

cypress.com/support

All other trademarks or registered trademarks referenced herein are the property of their respective owners.



Cypress Semiconductor
An Infineon Technologies Company
198 Champion Court
San Jose, CA 95134-1709

© Cypress Semiconductor Corporation, 2020. This document is the property of Cypress Semiconductor Corporation and its subsidiaries ("Cypress"). This document, including any software or firmware included or referenced in this document ("Software"), is owned by Cypress under the intellectual property laws and treaties of the United States and other countries worldwide. Cypress reserves all rights under such laws and treaties and does not, except as specifically stated in this paragraph, grant any license under its patents, copyrights, trademarks, or other intellectual property rights. If the Software is not accompanied by a license agreement and you do not otherwise have a written agreement with Cypress governing the use of the Software, then Cypress hereby grants you a personal, non-exclusive, nontransferable license (without the right to sublicense) (1) under its copyright rights in the Software (a) for Software provided in source code form, to modify and reproduce the Software solely for use with Cypress hardware products, only internally within your organization, and (b) to distribute the Software in binary code form externally to end users (either directly or indirectly through resellers and distributors), solely for use on Cypress hardware product units, and (2) under those claims of Cypress's patents that are infringed by the Software (as provided by Cypress, unmodified) to make, use, distribute, and import the Software solely for use with Cypress hardware products. Any other use, reproduction, modification, translation, or compilation of the Software is prohibited.

TO THE EXTENT PERMITTED BY APPLICABLE LAW, CYPRESS MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARD TO THIS DOCUMENT OR ANY SOFTWARE OR ACCOMPANYING HARDWARE, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. No computing device can be absolutely secure. Therefore, despite security measures implemented in Cypress hardware or software products, Cypress shall have no liability arising out of any security breach, such as unauthorized access to or use of a Cypress product. CYPRESS DOES NOT REPRESENT, WARRANT, OR GUARANTEE THAT CYPRESS PRODUCTS, OR SYSTEMS CREATED USING CYPRESS PRODUCTS, WILL BE FREE FROM CORRUPTION, ATTACK, VIRUSES, INTERFERENCE, HACKING, DATA LOSS OR THEFT, OR OTHER SECURITY INTRUSION (collectively, "Security Breach"). Cypress disclaims any liability relating to any Security Breach, and you shall and hereby do release Cypress from any claim, damage, or other liability arising from any Security Breach. In addition, the products described in these materials may contain design defects or errors known as errata which may cause the product to deviate from published specifications. To the extent permitted by applicable law, Cypress reserves the right to make changes to this document without further notice. Cypress does not assume any liability arising out of the application or use of any product or circuit described in this document. Any information provided in this document, including any sample design information or programming code, is provided only for reference purposes. It is the responsibility of the user of this document to properly design, program, and test the functionality and safety of any application made of this information and any resulting product. "High-Risk Device" means any device or system whose failure could cause personal injury, death, or property damage. Examples of High-Risk Devices are weapons, nuclear installations, surgical implants, and other medical devices. "Critical Component" means any component of a High-Risk Device whose failure to perform can be reasonably expected to cause, directly or indirectly, the failure of the High-Risk Device, or to affect its safety or effectiveness. Cypress is not liable, in whole or in part, and you shall and hereby do release Cypress from any claim, damage, or other liability arising from any use of a Cypress product as a Critical Component in a High-Risk Device. You shall indemnify and hold Cypress, its directors, officers, employees, agents, affiliates, distributors, and assigns harmless from and against all claims, costs, damages, and expenses, arising out of any claim, including claims for product liability, personal injury or death, or property damage arising from any use of a Cypress product as a Critical Component in a High-Risk Device. Cypress products are not intended or authorized for use as a Critical Component in any High-Risk Device except to the limited extent that (i) Cypress's published data sheet for the product explicitly states Cypress has qualified the product for use in a specific High-Risk Device, or (ii) Cypress has given you advance written authorization to use the product as a Critical Component in the specific High-Risk Device and you have signed a separate indemnification agreement.

Cypress, the Cypress logo, Spansion, the Spansion logo, and combinations thereof, WICED, PSoC, CapSense, EZ-USB, F-RAM, and Traveo are trademarks or registered trademarks of Cypress in the United States and other countries. For a more complete list of Cypress trademarks, visit cypress.com. Other names and brands may be claimed as property of their respective owners.