

Application Note

Timer_LED

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1. Preface

This application note describes the sample software of Timer_LED using 32-bit Timer Event counter (T32A). This document helps the user check operation of a product under development and develop its program.

2. Technical Term

Term/Abbreviation	Definition
BSP	Board Support Package
UART	Universal Asynchronous Receiver Transmitter
32A	32bit Timer Event Counter

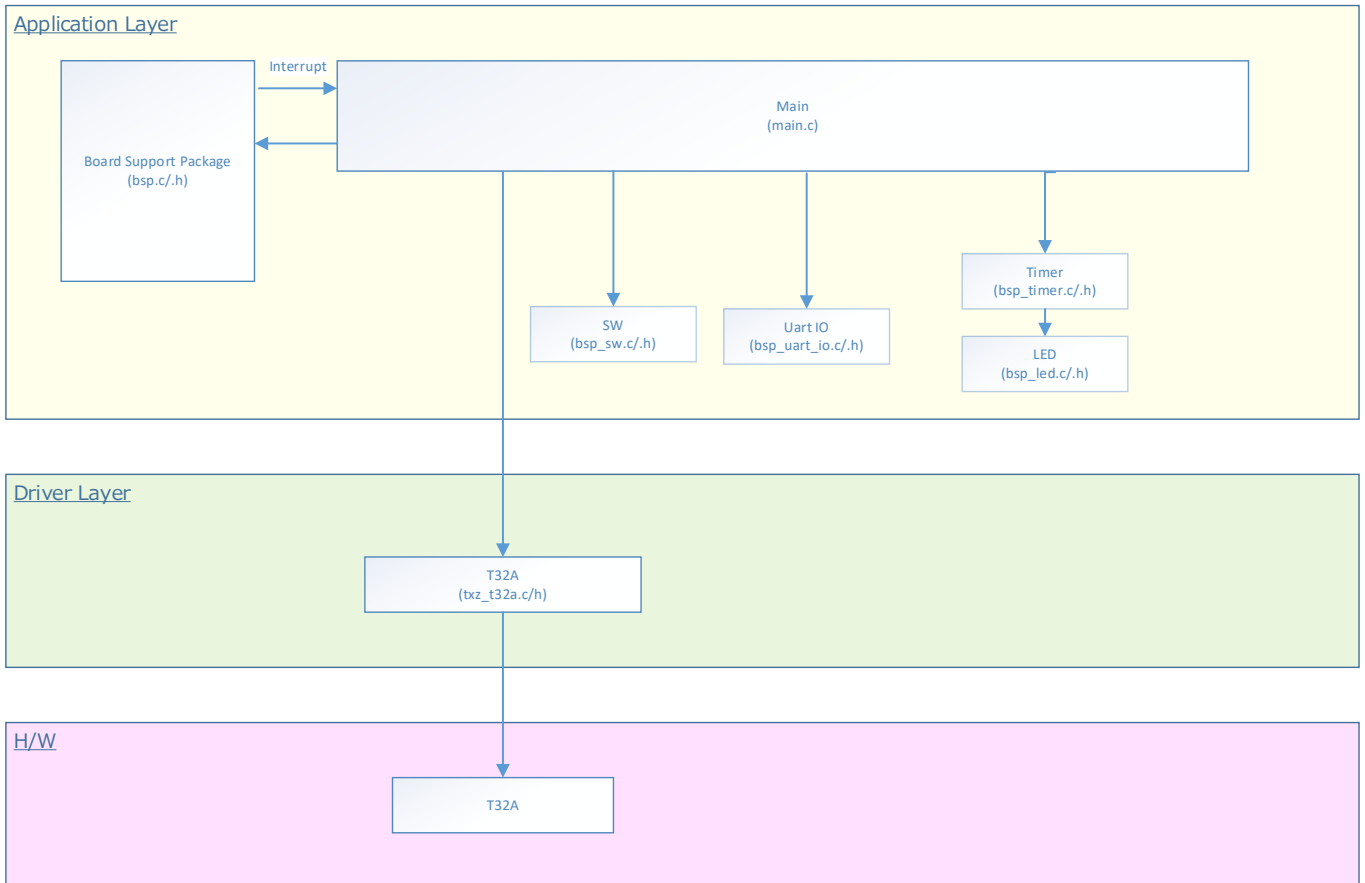
3. Reference Document

Document	Notes
Data sheet	Refer to the data sheet of MCU to be used.
Reference manual	Refer to the reference manual of each IP to be used.
Application note MCU User Guide	Refer to the MCU user manual to be used.

4. Target Sample Program

Sample Program	Outlines
Timer_LED	Sample of T32A function

5. Configuration Diagram



6. Sample Program: Timer_LED

This sample software turns on and off corresponding LED's every other second using T32A function.

6.1. Outlines of Operation

The LED's repeat turn-on and turn-off every other second using the T32A function (1-ms cycle).

BSP_PSW_0: BSP_LED_0 to BSP_LED_3 stop blinking.

BSP_PSW_1: BSP_LED_0 to BSP_LED_3 restart blinking.

6.2. Function to Use

The functions to use are as follows.

For the Port assignment of each channel, refer to the MCU user manual.

IP	Channel	Objective
UART	BSP_UART_0	Communication with the terminal emulator
PORT	BSP_PSW_0	PSW control
	BSP_PSW_1	PSW control
	BSP_LED_0	LED control
	BSP_LED_1	LED control
	BSP_LED_2	LED control
	BSP_LED_3	LED control

6.3. Interrupt to Use

Interrupt	Outlines
Timer Interrupt	Cycle interrupt

6.4. Configuration

"Timer_LED" configuration setting

Configuration	Set Value	Description
CFG_LED_BLINK_TIME	1000	LED blink cycle setting (ms)
CFG_SW_POLLING_TIME	100	SW polling time setting (ms)

6.5. Example of Terminal Emulator Output

6.5.1. Normal Operation

General Timer Period : 1sec

6.5.2. Case of Error Occurrence

Nothing.

7. T32A Driver

7.1. List of Drivers

The T32A is controlled by using the following drivers.
For an example of use, refer to the source code.

Interrupt Name	Control Outlines
t32a_Calculator	Timer value is calculated, then the timer register is set.
t32a_deinit	T32A object is released.
t32a_get_status	Status is acquired.
t32a_mode_init	T32A object mode is initialized.
t32a_reg_set	Timer register setting
t32a_SWcounter_start	When the timer is enabled, the counter is started.
t32a_SWcounter_stop	When the timer operates, the counter is stopped.
t32a_timer_init	T32A object is initialized.
t32a_timer_startIT	Timer operation is enabled.
t32a_timer_stopIT	Timer operation is disabled.
t32a_tmr_read	Timer register is read.

8. Revision History

Revision	Date	Description
1.0	2021-11-04	First release

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