Application Note

UART_HALF_CLOCK_TRANS_RECEIVE

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1. Preface

This application note describes the sample software of UART_HALF_CLOCK_TRANS and UART_HALF_CLOCK_RECEIVE using Half clock mode communication in Universal Asynchronous Receiver Transmitter (UART). 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
T32A	32bit Timer Event Counter

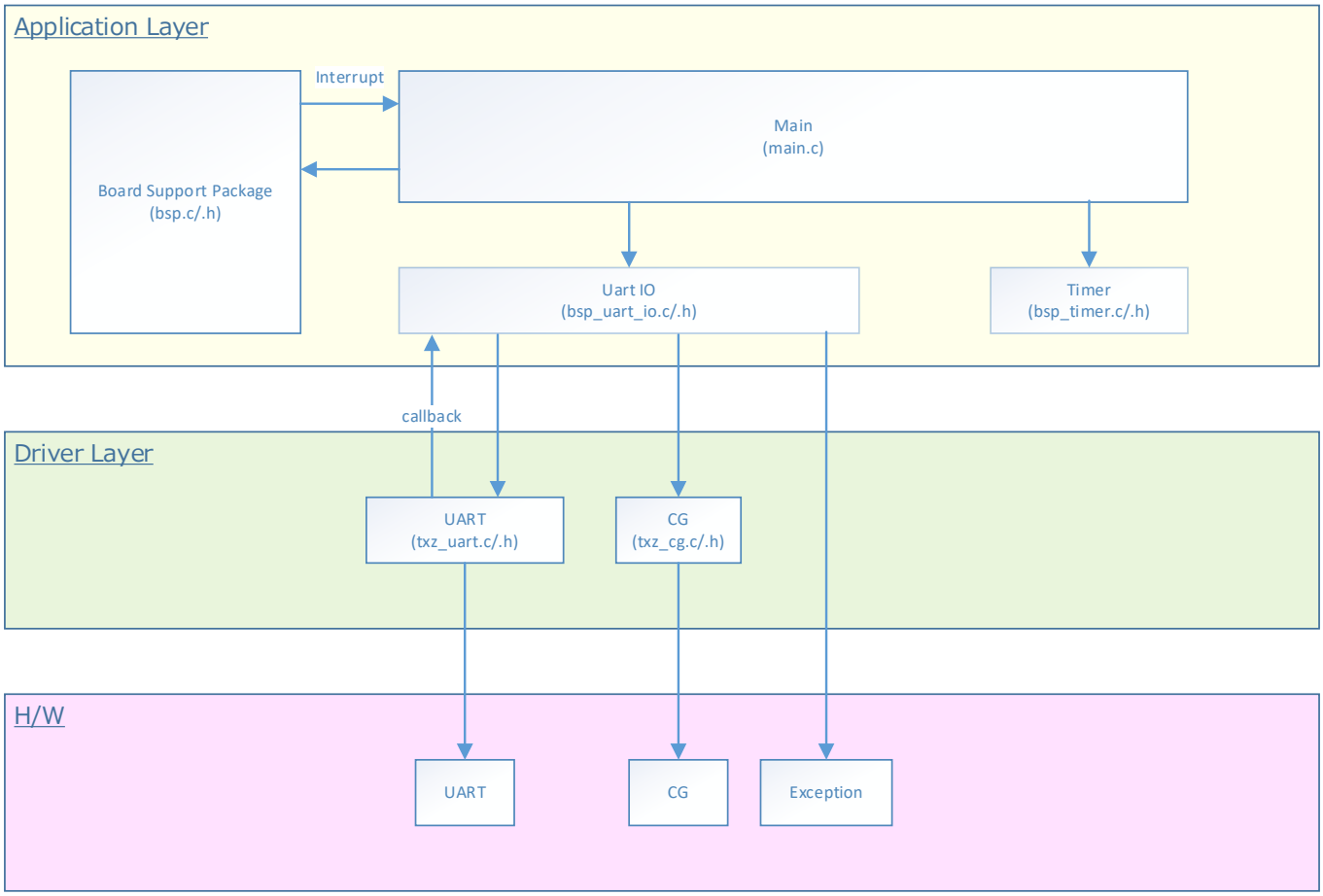
3. Reference Document

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
UART_HALF_CLOCK_TRANS	Transmission sample of UART Half clock communication mode
UART_HALF_CLOCK_RECEIVE	Reception sample of UART Half clock communication mode

5. Configuration Diagram



6. Sample Program: UART_HALF_CLOCK_TRANS/UART_HALF_CLOCK_RECEIVE

This sample software transmits data input from the terminal emulator to a transmission board. And it transfers the data from the transmission board (UART_HALF_CLOCK_TRANS) to a reception board (UART_HALF_CLOCK_RECEIVE) using UART Half clock mode communication.

6.1. Outlines of Operation

"TRANS DATA>" is displayed on the terminal emulator. Some characters should be input. The input data is transmitted by the transmission board to the reception board using the UART Half clock function.
After that, the data received by the reception board is displayed on the terminal emulator.

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
	BSP_UART_1	UART Half clock mode communication

6.3. Interrupt to Use

Interrupt	Outlines
UART Interrupt	UART reception interrupt
	UART transmission interrupt
	UART ERROR interrupt
	UART4 reception interrupt (Half clock mode communication)
	UART4 transmission interrupt (Half clock mode communication)
	UART4 ERROR interrupt (Half clock mode communication)

6.4. Configuration

Nothing.

6.5. Example of Terminal Emulator Output

6.5.1. Normal Operation

UART transmission side

```
UART HALF CLOCK TEST
 -----------------
| UART TRANS |
 -----------------
TRANS DATA > 1234567889012345678901234567890
```

UART reception side

```
UART HALF CLOCK TEST
 -----------------
| UART RECEIVE |
 -----------------
RECEIVE DATA > 1234567889012345678901234567890
```

6.5.2. Case of Error Occurrence

Nothing.

7. UART Driver

7.1. List of Drivers

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

Interface Name	Control Outlines
uart_deinit	UART object is released.
uart_disable_half_clock	Half clock mode is disabled.
uart_disable_loopback	Loopback is disabled.
uart_disable_wakeup	Wakeup is disabled.
uart_discard_receive	Reception is discarded.
uart_discard_transmit	Transmission is discarded.
uart_enable_half_clock	Half clock mode is enabled.
uart_enable_loopback	Loopback is enabled.
uart_enable_wakeup	Wakeup is enabled.
uart_get_boudrate_setting	Baud rate setting is acquired.
uart_get_error	Error information is acquired.
uart_get_status	Status is acquired.
uart_init	UART object is initialized.
uart_mdma_deinit	UART MDMA object is released.
uart_mdma_discard_receive	Reception is discarded.
uart_mdma_discard_transmit	Transmission is discarded.
uart_mdma_get_uart_ch_to_mdma_ch	From UART channel to MDMA channel
uart_mdma_init	UART MDMA object is initialized.
uart_mdma_receiveIt	Data is received. Non-blocking communication.
uart_mdma_transmitIt	Data is transmitted. Non-blocking communication.
uart_receiveIt	Data is received. Non-blocking communication.
uart_send_break	Break is transmitted.
uart_stop_break	Break is stopped.
uart_transmitIt	Data is transmitted. Non-blocking communication.

8. Revision History

Rev	Date	Description
1.0	2021-11-04	First release

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