Application Note

EI2C_MASTER_SLAVE

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1. Preface

This application note describes the sample software of EI2C_MASTER_SLAVE using Inter-Integrated Circuit (I2C). This document helps the user check operation of a product under development and develop its program.

2. Technical Term

Term/Abbreviation	Definition
I2C	Inter-Integrated Circuit
UART	Universal Asynchronous Receiver Transmitter

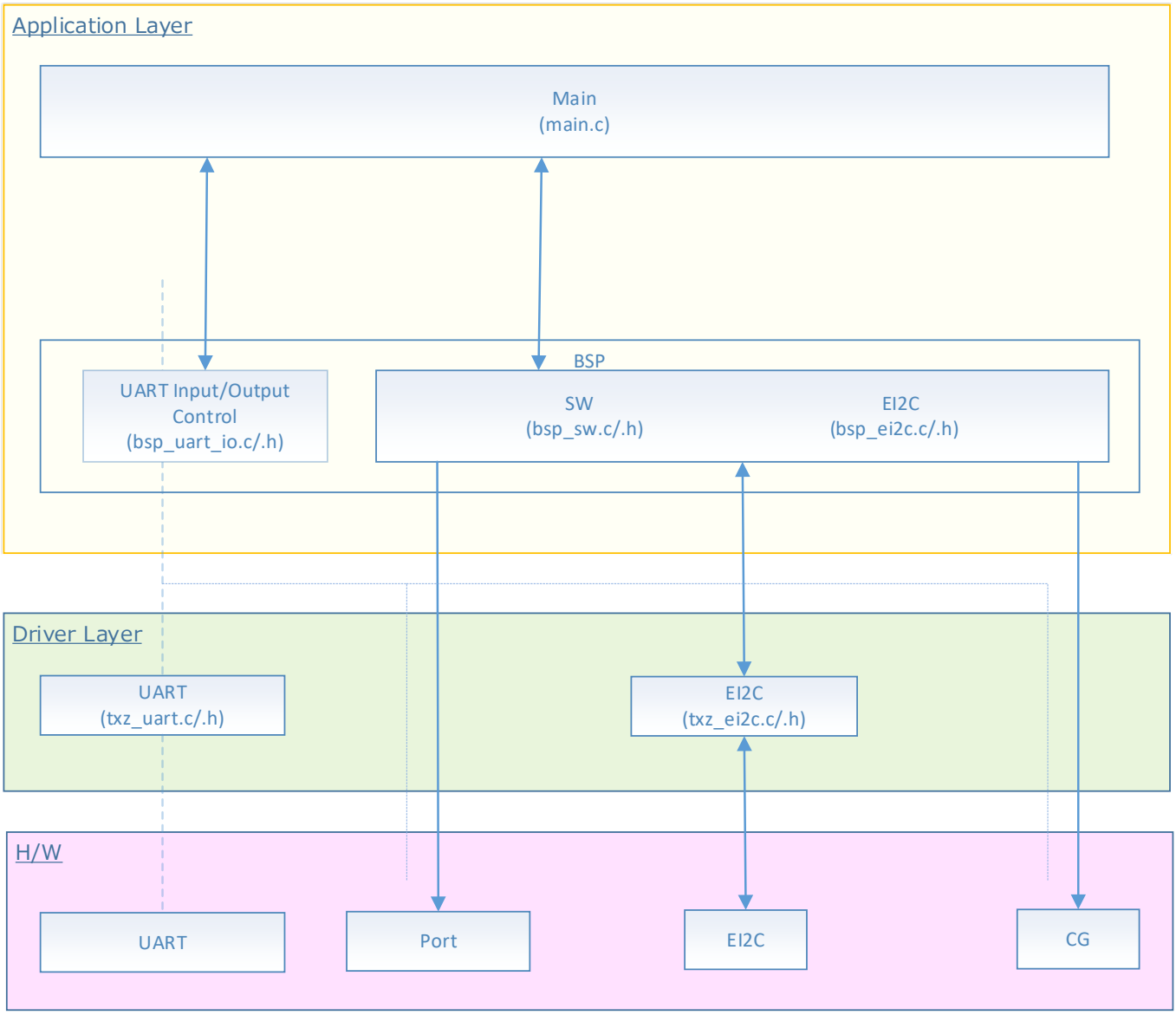
3. Reference Document

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
EI2C_MASTER_SLAVE	Sample of EI2C function

5. Configuration Diagram



6. Sample Program: EI2C_MASTER_SLAVE

This sample software transmits data as Master using EI2C function, and receives data as Slave. The received data is output on the terminal emulator.

6.1. Outlines of Operation

"command >" is displayed on the terminal emulator.
When proper characters are input according to the command format, the MCU executes the EI2C Master operation or the EI2C Slave operation (Default is the Master mode).
The switching from Master to Slave is done by a command. The command can be input when the EI2C operates in the Master mode.
If Slave side cancel the request, the Slave returns NACK.

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
EI2C	BSP_EI2C_0	Communication with EI2C
UART	BSP_UART_0	Communication with the terminal emulator

6.3. Interrupt to Use

Interrupt	Outlines
I2C Interrupt	I2C transmission buffer empty interrupt
	I2C reception buffer full interrupt
	I2C status interrupt
UART Interrupt	UART reception interrupt
	UART transmission interrupt
	UART ERROR interrupt

6.4. Configuration

Nothing.

6.5. Example of Terminal Emulator Output

6.5.1. Normal Operation

Case of Master

```
EI2C TEST - EI2Cx
 -----------------
|EI2C master mode |
 -----------------
command > write
master
sa      B0
tx[0] 00
tx[1] 01
tx[2] 02
tx[3] 03
command > read
master
sa      B0
tx[0] 00
tx[1] 01
rx[0] 80
rx[1] 81
command >
```

※x=CH number
Please refer to MCU User Guide for CH number

Case of Slave

```
EI2C TEST - EI2Cx
 -----------------
| EI2C master mode |
 -----------------
command > slave
 ----------------
| EI2C slave mode |
 ----------------
slave
sa      B0
rx[0] 00
rx[1] 01
rx[2] 02
rx[3] 03
slave
sa      B0
rx[0] 00
rx[1] 01
tx[0] 80
tx[1] 81
slave
sa      B0
```

※x=CH number
Please refer to MCU User Guide for CH number

6.5.2. Case of Error Occurrence

Nothing.

7. EI2C Driver

7.1. List of Drivers

The EI2C is controlled by using the following drivers.
For an example of use, refer to the source code.

Interface Name	Control Outlines
EI2C_acr1_clear	Generate stop condition.
EI2C_clear_int_rscf	Clear interrupt status.
EI2C_clear_int_status	Clear interrupt status.
EI2C_clear_int_stcf	Clear interrupt status.
EI2C_clear_int_tbe	Clear interrupt status.
EI2C_clear_int_tend	Clear interrupt status.
EI2C_disable_interrupt	To disable setting of interrupt.
EI2C_enable_interrupt	To able setting of interrupt.
EI2C_get_ack	Return received ACK Status.
EI2C_init	Initialize I2C register.
EI2C_int_status	Interrupt status
EI2C_master	Return Master status.
EI2C_port_high	Return whether SDA and SCL are in high status.
EI2C_read_data	Read from data buffer.
EI2C_reset	Reset EI2C.
EI2C_restart	Return restart condition.
EI2C_restartcondition	Output iteration start condition
EI2C_set_ack	Set ACK condition
EI2C_set_address1	Set slave address.
EI2C_set_address2	Set slave address
EI2C_slave_detected	Detect slave address.
EI2C_slave_init	Initialize SLAVE mode.
EI2C_startcondition	Output start condition.
EI2C_status_arbitration	Arbitration status.
EI2C_status_busy	Return busy status
EI2C_status_rscf	Rscf status.
EI2C_status_spcf	Spcf status.
EI2C_status_stcf	Stcf status
EI2C_status_tbe	Tbe status
EI2C_status_tend	Tend status.
EI2C_stop_condition	Generate stop condition.
EI2C_transmitter	Return send status.
EI2C_write_data	Write to data buffer.

8. Revision History

Revision	Date	Description
1.0	2021-10-18	First release

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