

Application Note

EI2C MultiMaster

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1. Preface

This application note describes sample software for the I2C Multi Master control function using the I2C driver.

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 interface version A
BSP	Board Support Package
UART	Universal Asynchronous Receiver Transmitter

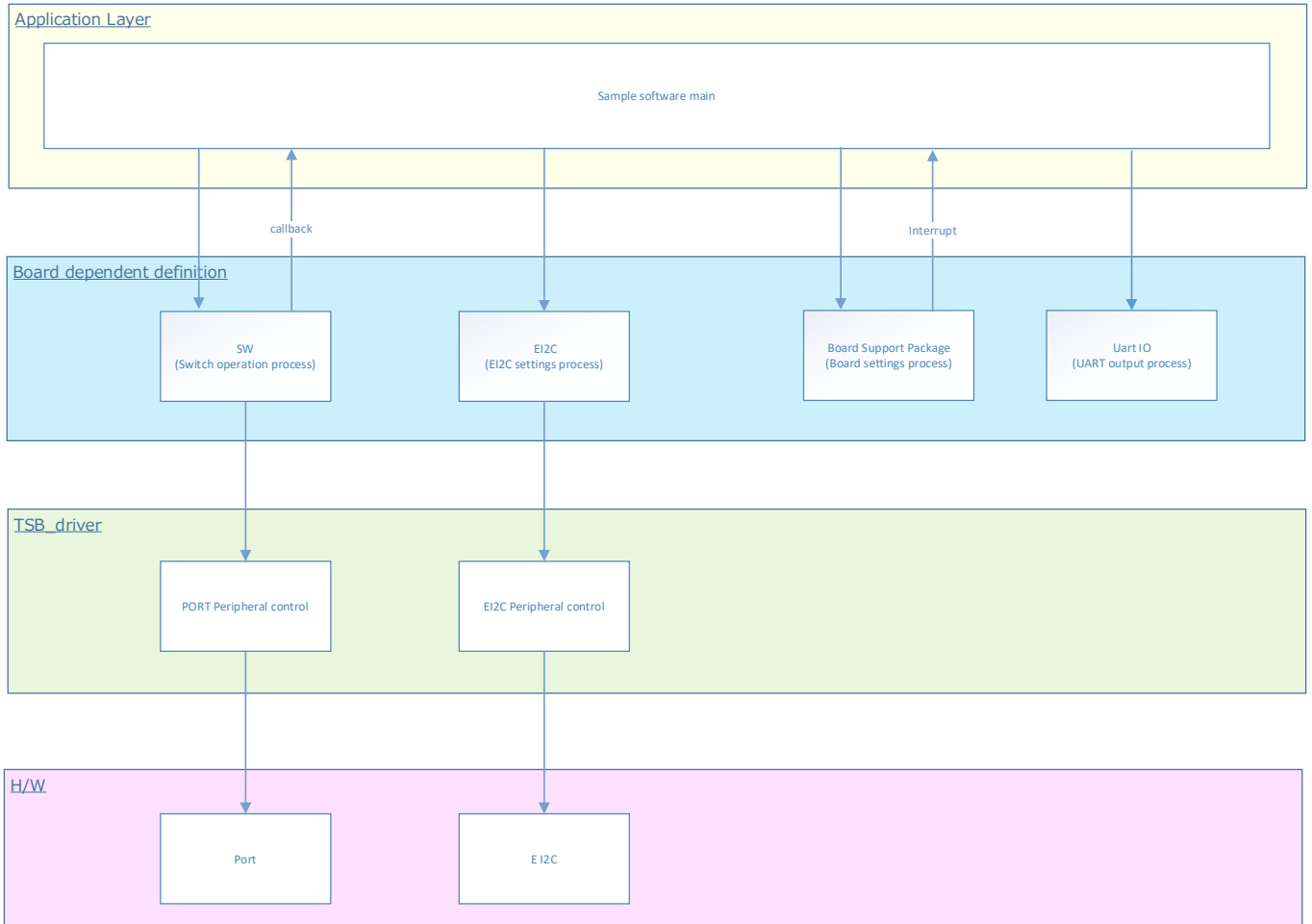
3. Reference Document

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 guide to be used.

4. Target Sample Program

Sample Program	Outline
EI2C_MultiMaster	Sample program of EI2C_MultiMaster function

5. Configuration Diagram



6. Sample Program : EI2C_MultiMaster

This is sample software to check the operation of normal access, Bus, Busy, Arbitration Lost, etc. using two evaluation boards (A, B).

Request EI2C Read / Write to Slave Device mounted on evaluation board A at the timing of pressing BSP_PSW_1.

6.1. Outlines of Operation

- Evaluation board A
When BSP_PSW_1 is pressed, a Write Request for Data A for Size A is made from Sub Address A of Slave Device.
If you press BSP_PSW_1 again, a Read Request for Size B will be made from Sub Address B of the Slave Device.
- Evaluation board B
The basic operation is the same as evaluation board A. Change Sub Address B to Sub Address C. Also, change Size B to Size C.

6.2. Function to Use

The functions to use are as follows.

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

IP	Channel	Objective
EI2C	BSP_EI2C_1	For EI2C control. Works as a Master Device or Slave Device
PORT(Push-witch)	BSP_PSW_1	For event triggers
UART	BSP_UART_1	For terminal emulator communication. Output the operation log

6.3. Interrupt to Use

Interrupt	Outlines
INTI2C1NST	EI2C ch.1 Status interrupt
INTI2C1ATX	EI2C ch.1 Send buffer empty interrupt
INTI2C1BRX	EI2C ch.1 Receive buffer empty interrupt
INT17_18_32_33	External interrupt when PSW is pressed
INTUART0RX	UART ch0 Receive interrupt. For terminal emulator
INTUART0TX	UART ch0 Transmission interrupt. For terminal emulator
INTUART0ERR	UART ch0 Error interrupt. For terminal emulator

6.4. Configuration

“main.c” configuration setting.

Configuration	Current Value	Description
Sub Address A	0x0000	-
Size A	Size of (Data A)	Data A
Data A	“toshibaABCDEFGHJKLMNO PQRST”	-
Sub Address B	0x0000	-
Size B.	Size of (Data A)	-
Sub Address C	0x0004	-
Size C	Size of (Data A) - 4	-

6.5. Example of Terminal Emulator Output

6.5.1. Normal Operation

- Evaluation board A

```
command >
write data > toshbaABCDEF GHIJKLMNOPQRST
read data >
toshibaABCDEF GHIJKLMNOPQRST
```

- Evaluation board B

```
command >
write data > toshibaABCDEF GHIJKLMNOPQRST
read data >
ibaABCDEF GHIJKLMNOPQRST
```

6.5.2. Case of Error Occurrence

- Evaluation board A

```
read data >
bus busy error !!
```

- Evaluation board B

```
read data >
bus busy error !!
read data >
arbitraion error !!
```

7. I2C Driver

The A_I2C is controlled by using the following interface.
For an example of use, refer to the source code.

Driver	Control Outlines
EI2C_init	EI2C Register initialization
EI2C_restartcondition	Generate restart condition
EI2C_startcondition	Generate start condition
EI2C_slave_init	Slave mode setting

8. Revision History

Revision	Date	Description
1.0	2023-06-28	First release

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