Application Note

I2C_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
BSP	Board Support Package
UART	Universal Asynchronous Receiver Transmitter

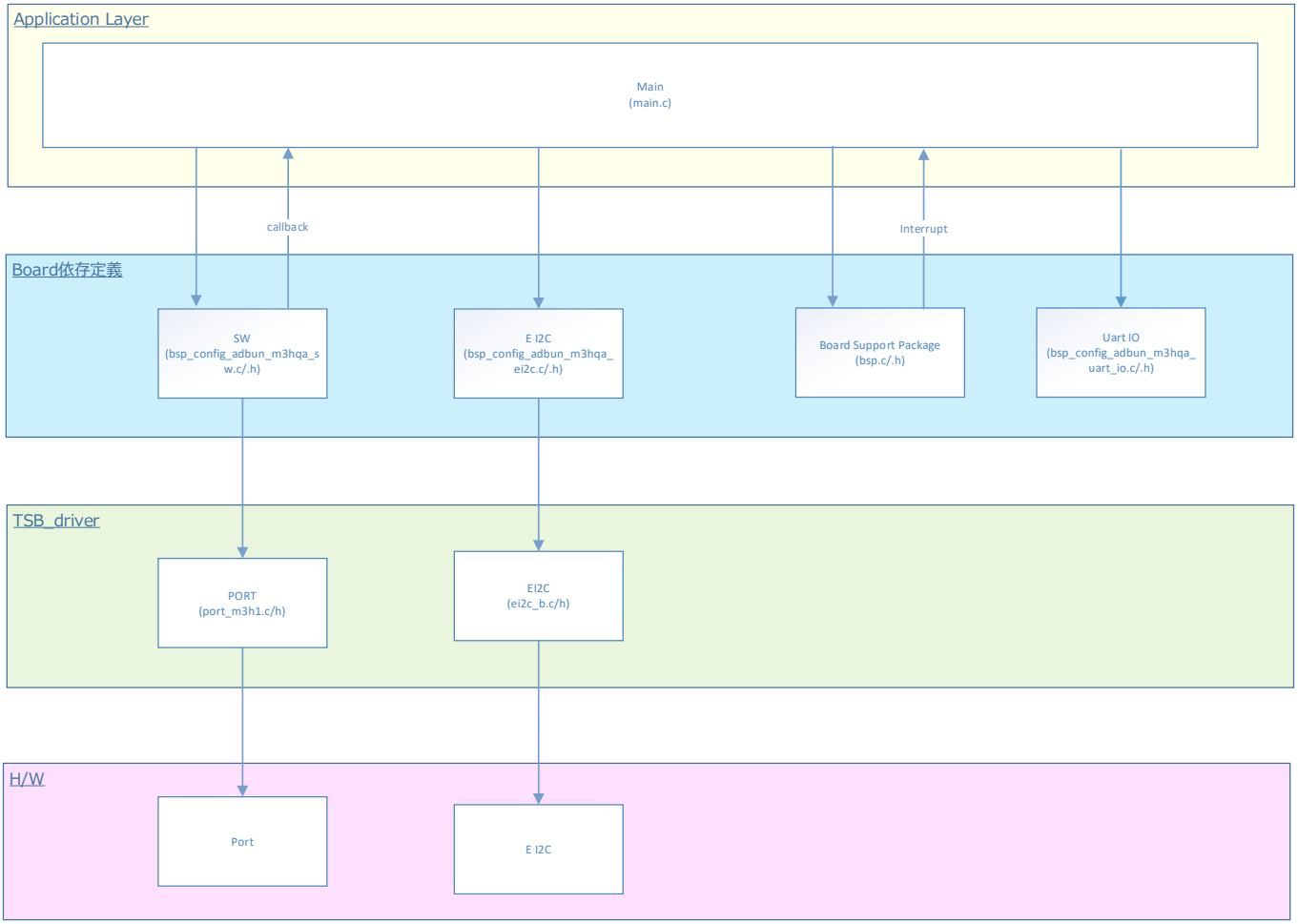
3. Reference Document

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 manual to be used.
Driver API list	Refer to the MCU Doc folder to be used.

4. Target Sample Program

Sample Program	Outline
I2C_MultiMaster	Sample program of I2C_MultiMaster function

5. Configuration Diagram



6. Sample Program：I2C_MultiMaster

This is sample software to check the operation of normal access, Bus, Busy, Arbitration Lost, etc. using two evaluation boards (A, B).
Request I2C 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 manual.

IP	Channel	Objective
I2C	BSP_ I2C_1	For I2C control. Works as a Master Device or Slave Device
PORT(Push-Switch)	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
INT17_18_32_33	External interrupt when PSW is pressed
INTT32A00A	T32A Timer A Timer counter increment every 1ms for Switch processing
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	“toshibaABCDEFGHIJKLMNOPQRST”	-
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 > toshbaABCDEFGHIJKLMNOPQRST
read data >
toshibaABCDEFGHIJKLMNOPQRST
```

・Evaluation board B

```
command >
write data > toshibaABCDEFGHIJKLMNOPQRST
read data >
ibaABCDEFGHIJKLMNOPQRST
```

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

7.1. List of driver

The I2C is controlled by using the following interface.
For an example of use, refer to the source code.

Driver	Control Outlines
I2C_init	I2C Register initialization
I2C_start_condition	Generate start condition
I2C_get_clock_setting	Return I2C clock settings
I2C_slave_init	Slave mode setting

7.2. Details

See “3. Reference Documents” for more information.

8. Revision History

Revision	Date	Description
1.0	2022-04-08	First release

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