

## Application Note

# FUART Echo MDMAC

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## 1. Preface

This application note describes the sample software of FUART\_Echo\_MDMAC using Full Universal Asynchronous Receiver Transmitter (FUART). This document helps the user check operation of a product under development and develop its program.

## 2. Technical Term

Term/Abbreviation	Definition
FUART	Full Universal Asynchronous Receiver Transmitter
MDMAC	Multi-function Direct Memory Access Controller
UART	Universal Asynchronous Receiver Transmitter

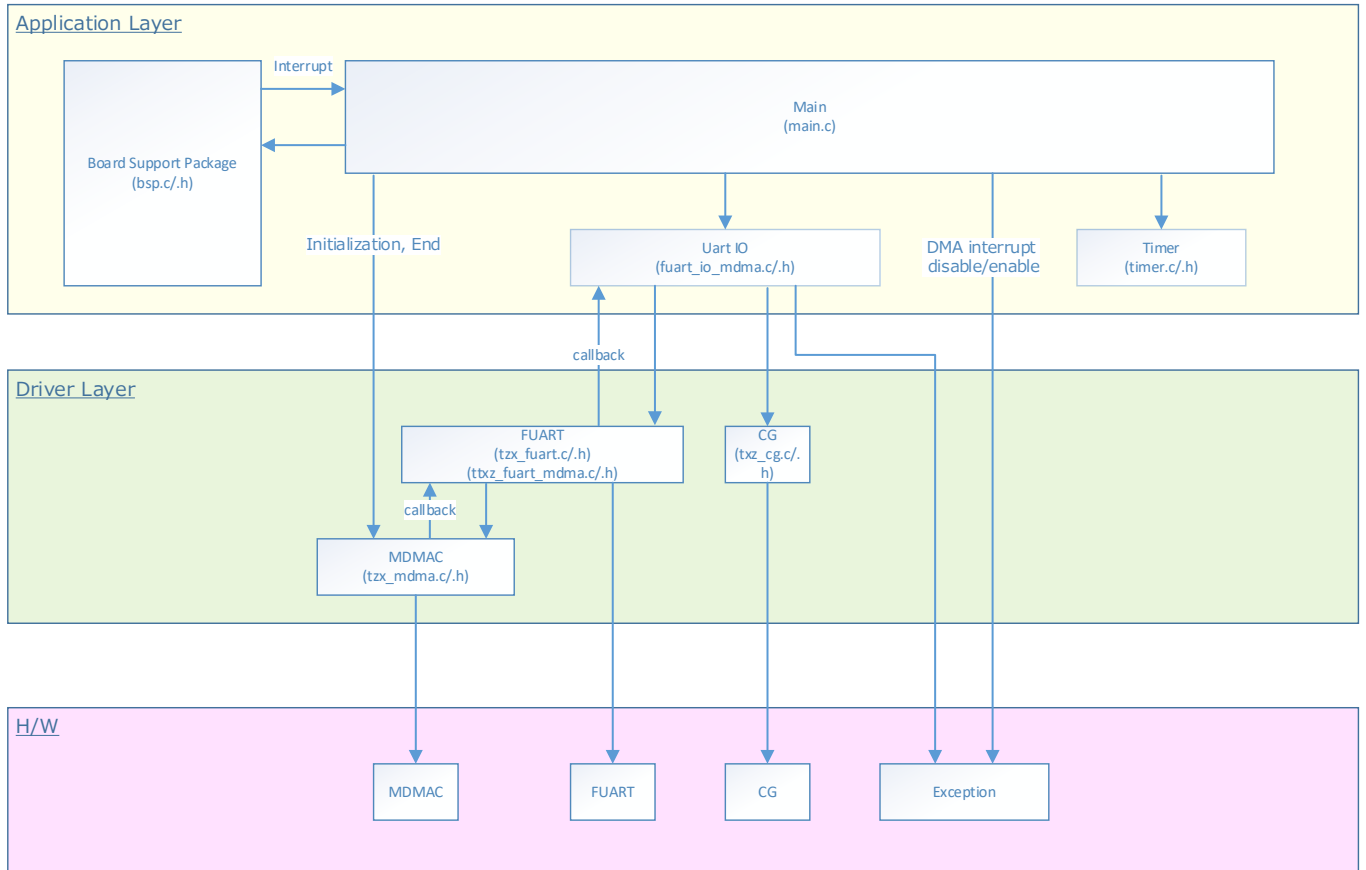
## 3. Reference Document

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
FUART_Echo_MDMAC	Sample of FUART Echo MDMAC

## 5. Configuration Diagram



## 6. Sample Program: FUART\_Echo\_MDMAC

This sample software does echo-back output of data input from the terminal emulator via MDMA using FUART function.

### 6.1. Outlines of Operation

Date input from the terminal emulator is echoed back.

- "Input =" is displayed on the terminal emulator.
- After the initial view is displayed, "123456" should be input. And "Enter" is pushed down.
- The echo-back data "Echo = 123456" 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
FUART	BSP_FUART_0	Communication with the terminal emulator

### 6.3. Interrupt to Use

Interrupt	Outlines
MDMAC Interrupt	MDMAC transmission end interrupt
	MDMAC bus error interrupt
	MDMAC descriptor error interrupt

### 6.4. Configuration

Nothing.

## 6.5. Example of Terminal Emulator Output

### 6.5.1. Normal Operation

Initial display

```
Input =
```

When inputting "Enter" after inputting character

```
Input = 123456
```

Output echo-back

```
Input = 123456  
Echo = 123456
```

### 6.5.2. Case of Error Occurrence

```
Input = 01234567890123456789012345678901  
Input Error !!
```

## 7. FUART Driver

### 7.1. List of Drivers

The FUARTFUART\_Echo\_MDMAC is controlled by using the following drivers.  
For an example of use, refer to the source code.

Interface Name	Control Outlines
fuart_deinit	FUART object is released.
fuart_discard_receive	Reception is discarded.
fuart_discard_transmit	Transmission is discarded.
fuart_get_boudrate_setting	Baud rate setting is acquired.
fuart_get_error	Error information is acquired.
fuart_get_status	Status is acquired.
fuart_init	FUART object is initialized.
fuart_mdma_deinit	FUART MDMA object is released.
fuart_mdma_discard_receive	Reception is discarded.
fuart_mdma_discard_transmit	Transmission is discarded.
fuart_mdma_get_fuart_ch_to_mdma_ch	From UART channel to MDMA channel
fuart_mdma_init	FUART MDMA object is initialized.
fuart_mdma_receivevt	Data is received. Non-blocking communication.
fuart_mdma_RXE_disable	RXE disable
fuart_mdma_RXE_enable	RXE enable
fuart_mdma_transmitlt	Data is transmitted. Non-blocking communication.
fuart_mdma_TXE_disable	TXE disable
fuart_mdma_TXE_enable	TXE enable
fuart_receivevt	Data is received. Non-blocking communication.
fuart_send_break	-
fuart_stop_break	-
fuart_transmitlt	Data is transmitted. Non-blocking communication.

## 8. Revision History

Revision	Date	Description
1.0	2021-10-28	First release



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