Application Note

TMPM471F10 User Guide

Table of Contents

1. Preface

This application note describes a reference for the usage environment when running the sample program on TMPM471F10.
If you select something other than TMPM471F10 on the MCU, a compile error may occur due to insufficient terminal or IP channel.
In that case, please modify the program and check the operation.

2. Technical Term

Term/Abbreviation	Definition
BSP	Board Support Package
UART	Universal Asynchronous Receiver Transmitter
LED	Light-emitting diode
TSPI	Toshiba Serial Peripheral Interface
EI2C	Enhanced Inter-Integrated Circuit

3. Reference Document

Document	Notes
TX-TMPM471F10FG Data sheet	-
Reference manual	Refer to the reference manual of each IP to be used.
Application note	Refer to the application note of sample software to be used.

4. Operation Confirmation Condition

Item	Name	Version
Used Microcontroller	TMPM471F10FG	-
Used Board	SBK-M471	-
Integrated Development Environment	IAR Embedded Workbench for ARM	9.50.2
Integrated Development Environment	Arm® Keil® MDK	5.40.00
Integrated Development Environment	SEGGER Embedded Studio	8.12a
Sample Program	TXZp_TMPM471F10_V101	V1.0.1

5. Used Channel and Port Assignment

5.1. User Interface

5.1.1. Push-Switch

Channel	Function	Port
BSP_PSW_1	Input	PE5
BSP_PSW_2	Input	PE4
BSP_PSW_3	Input	PE3
BSP_PSW_4	Input	PA7
BSP_PSW_5	Input	-

5.1.2. Slide-Switch

Channel	Function	Port
BSP_SSW_1	Input	PA0
BSP_SSW_2	Input	PA1
BSP_SSW_3	Input	PA2
BSP_SSW_4	Input	PA3

5.1.3. LED

Channel	Function	Port
BSP_LED_1	Output	PC0
BSP_LED_2	Output	PC2
BSP_LED_3	Output	PC4
BSP_LED_4	Output	PE6
BSP_LED_5	Output	PE7
BSP_LED_6	Output	PC6

5.2. Communication

5.2.1. UART Communication

Channel	Peripheral Channel	Function	Port
BSP_UART_1	ch0	BSP_UART1_TXD	PE0
		BSP_UART1_RXD	PE1
		BSP_UART1_CTS	-
		BSP_UART1_DTR	-
BSP_UART_2	-	BSP_UART2_TXD	-
		BSP_UART2_RXD	-
		BSP_UART2_CTS	-
		BSP_UART2_DTR	-

5.2.2. TSPI Communication

Channel	Peripheral Channel	Function	Port
BSP_TSPI_1	ch2	BSP_SPI1_TXD	PD5
		BSP_SPI1_RXD	PD6
		BSP_SPI1_SCK	PD4
		BSP_SPI1_CS	PD2
		BSP_SPI1_CSIN	PD3
BSP_TSPI_2	-	BSP_SPI2_TXD	-
		BSP_SPI2_RXD	-
		BSP_SPI2_SCK	-
		BSP_SPI2_CS	-
		BSP_SPI2_CSIN	-

5.2.3. EI2C Communication

Channel	Peripheral Channel	Function	Port
BSP_EI2C_1	ch0	BSP_EI2C1_SCL	PN1
		BSP_EI2C1_SDA	PN0
BSP_EI2C_2	-	BSP_EI2C2_SCL	-
		BSP_EI2C2_SDA	-

5.3. Timer

Channel	Peripheral Channel	Function	Port
BSP_T32A_1	BSP_T32A_TIMER_1	1ms Timer	-
BSP_T32A_2	BSP_T32A_PPG_1	ch4A: Pulse Output (T32A_PPG Sample)	PD1
BSP_T32A_3	BSP_T32A_PPG_2	ch4A: Pulse Output (TRM Sample)	PD1
BSP_T32A_4	BSP_T32A_CAPT_1	ch4B: Pulse Input (TRM Sample)	PF0
BSP_T32A_7	BSP_T32A_CAPT_2	ch4B: Pulse Input (T32A_MEASURE Sample)	-

5.4. ADC

Channel	Peripheral Channel	Function	Port
BSP_ADC_1	BSP_THERMISTOR_1	Variable resistance voltage	-
BSP_ADC_2	BSP_VR_1	Variable resistance voltage	PP1
BSP_ADC_3	BSP_VR_2	Variable resistance voltage	-

5.5. A-ENC32

Channel	Peripheral Channel	Function	Port
BSP_ENC_1	BSP_ENC1_A	Encoder input	PF2
	BSP_ENC1_B	Encoder input	PF3
	BSP_ENC1_Z	Encoder input	-
BSP_ENC_2	BSP_ENC2_A	Encoder input	-
	BSP_ENC2_B	Encoder input	-
	BSP_ENC2_Z	Encoder input	-

6. System Setting

6.1.1. Power supply voltage

V	Notes
5.0	-

6.1.2. Clock setting (Note)

Clock	Function	MHz	Notes
fEHOSC	External oscillator	10	-
fIHOSC	Internal oscillator	10	-
fs	Low-speed oscillator	None	-
fc	High-speed clock	160	-
fsys	-	-	-
fsysh	High speed system clock	160	-
fsysm	Medium speed system clock	80	-
φT0	-	-	-
φT0h	High speed pre-scaler clock	160	-
φT0m	Medium speed pre-scaler clock	80	-

Note: It's basic setting. Settings change depending on the sample software.

7. Communication Setting

7.1. UART Communication Setting

7.1.1. UART Setting

Item	Setting Value	Notes
Baud Rate	115200(bps)	-
Data Length	8(bit)	-
Parity	None	-
Stop Bit	1(bit)	-
Flow Control	None	-

7.1.2. Log Control line feed code

Item	Setting Value	Notes
[line feed] (Send to Terminal emulator)	LF	-
[line feed] (Receive from Terminal emulator)	LF	-

7.1.3. Log Control error

Item	Setting Value	Notes
Error Log_Command	"Command Error!![line feed]"	When an unsupported command is entered
Error Log_Parameter	"Parameter Error!![line feed]"	Command parameter is not the expected value
Error Log_Input	"Input Error!![line feed]"	When an input request other than a command is not an expected value
Error Log_Erasing	"Erasing Error!![line feed]"	Used in Flash samples
Error Log_Writing	"Writing Error!![line feed]"	Used in Flash samples
Error Log_Reading	"Reading Error!![line feed]"	Used in Flash samples

7.1.4. Log Control and others

Item	Setting Value	Notes
MCU name	TMPM471F10	-

7.2. I2C Communication Setting

7.2.1. I2C Setting

Item	Setting Value	Notes
I2C Clock (EI2C-A)	800KHz	In Master operation
I2C Clock (I2C-B)	-	-
Data Length	8bit	-
Acknowledge	Available	-
Start/Stop Condition	Generated	-

7.2.2. Slave Operating Specifications

Item	Setting Value	Notes
Slave Address	0x60	Indicates 7bit that enters <7:1>
Sub Address Size	0x02	Sub Address is 2byte
Start Sub Address	0x0000	Indicates the leading Address of Sub Address
Data Size	0x10	Indicates the valid data size (byte) >>Sub Address range:0000-000F
Init Value	0x55	Initial value of Data.
Dummy Data	0xAA	This is returned when Read request is out of scope

7.3. SPI Communication Setting

Item	Setting Value	Notes
SPI Clock	13.3MHz	In Master operation
Data Length	8bit	-
Parity	None	-
Data Transfer Direction	MSB	-

8. Flash Control range

8.1. Reference Manual

Reference manual	Notes
TXZ+ Family Reference Manual Flash Memory	FLASH10MUD32-A

8.2. Code Flash Required specification control range

Code Area	Start	Stop	Notes	Notes
Code Flash All area	0x00000000	0x000FFFFF	1024kbyte	
Code Flash Area 0	0x00000000	0x0007FFFF	512 kbyte	
Code Flash Block 0	0x00000000	0x00007FFF	32 kbyte	User Boot
Code Flash Page 0	0x00000000	0x00000FFF	4 kbyte	
Code Flash Page 1	0x00001000	0x00001FFF	4 kbyte	
Code Flash Page 2	0x00002000	0x00002FFF	4 kbyte	
Code Flash Page 3	0x00003000	0x00003FFF	4 kbyte	
Code Flash Page 4	0x00004000	0x00004FFF	4 kbyte	
Code Flash Page 5	0x00005000	0x00005FFF	4 kbyte	
Code Flash Page 6	0x00006000	0x00006FFF	4 kbyte	
Code Flash Page 7	0x00007000	0x00007FFF	4 kbyte	
Code Flash Page SIZE	0x1000	-	4 kbyte	
Code Flash Block 1	0x00008000	0x0000FFFF	32 kbyte	CODE areas A
Code Flash Block 2	0x00010000	0x00017FFF	32 kbyte	CODE areas B

8.3. Code Flash User Information Required specification control range

Code Area	Start	Stop	Notes	Notes
UserInformation All area	0x5E005000	0x5E005FFF	4 kbyte	

8.4. Data Flash Required specification control range

Code Area	Start	Stop	Notes	Notes
Data Flash All area	-	-	-	
Data Flash Block 0	-	-	-	
Data Flash Page 0	-	-	-	
Data Flash Page 1	-	-	-	
Data Flash Page SIZE	-	-	-	

9. Precautions for Use

Please confirm the operation sufficiently if use in an environment other than the operation check environment.

10. Revision History

Revision	Date	Description
1.0	2025-01-20	First release

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