



1. Description

1.1. Project

Project Name	Button
Board Name	custom
Generated with:	STM32CubeMX 6.3.0
Date	11/13/2023

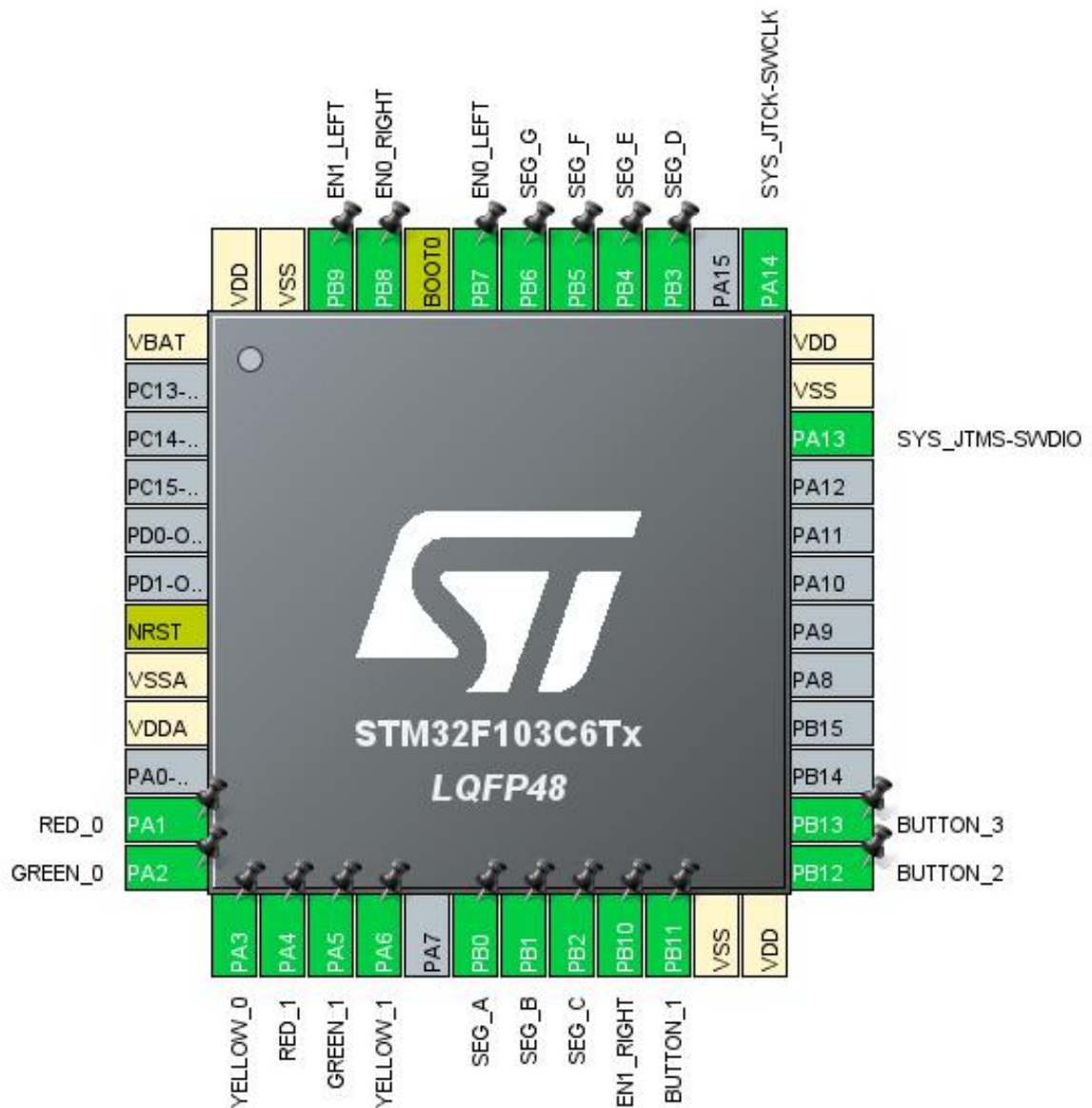
1.2. MCU

MCU Series	STM32F1
MCU Line	STM32F103
MCU name	STM32F103C6Tx
MCU Package	LQFP48
MCU Pin number	48

1.3. Core(s) information

Core(s)	Arm Cortex-M3
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2. Pinout Configuration



3. Pins Configuration

Pin Number LQFP48	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
7	NRST	Reset		
8	VSSA	Power		
9	VDDA	Power		
11	PA1 *	I/O	GPIO_Output	RED_0
12	PA2 *	I/O	GPIO_Output	GREEN_0
13	PA3 *	I/O	GPIO_Output	YELLOW_0
14	PA4 *	I/O	GPIO_Output	RED_1
15	PA5 *	I/O	GPIO_Output	GREEN_1
16	PA6 *	I/O	GPIO_Output	YELLOW_1
18	PB0 *	I/O	GPIO_Output	SEG_A
19	PB1 *	I/O	GPIO_Output	SEG_B
20	PB2 *	I/O	GPIO_Output	SEG_C
21	PB10 *	I/O	GPIO_Output	EN1_RIGHT
22	PB11 *	I/O	GPIO_Input	BUTTON_1
23	VSS	Power		
24	VDD	Power		
25	PB12 *	I/O	GPIO_Input	BUTTON_2
26	PB13 *	I/O	GPIO_Input	BUTTON_3
34	PA13	I/O	SYS_JTMS-SWDIO	
35	VSS	Power		
36	VDD	Power		
37	PA14	I/O	SYS_JTCK-SWCLK	
39	PB3 *	I/O	GPIO_Output	SEG_D
40	PB4 *	I/O	GPIO_Output	SEG_E
41	PB5 *	I/O	GPIO_Output	SEG_F
42	PB6 *	I/O	GPIO_Output	SEG_G
43	PB7 *	I/O	GPIO_Output	EN0_LEFT
44	BOOT0	Boot		
45	PB8 *	I/O	GPIO_Output	EN0_RIGHT
46	PB9 *	I/O	GPIO_Output	EN1_LEFT
47	VSS	Power		
48	VDD	Power		

* The pin is affected with an I/O function

5. Software Project

5.1. Project Settings

Name	Value
Project Name	Button
Project Folder	D:\HCMUT\KNOWLEDGE\Github\HCMUT\Team\CO3007-2111203\CO3007-
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_F1 V1.8.5
Application Structure	Advanced
Generate Under Root	Yes
Do not generate the main()	No
Minimum Heap Size	0x200
Minimum Stack Size	0x400

5.2. Code Generation Settings

Name	Value
STM32Cube MCU packages and embedded software	Copy only the necessary library files
Generate peripheral initialization as a pair of '.c/.h' files	No
Backup previously generated files when re-generating	No
Keep User Code when re-generating	Yes
Delete previously generated files when not re-generated	Yes
Set all free pins as analog (to optimize the power consumption)	No
Enable Full Assert	No

5.3. Advanced Settings - Generated Function Calls

Rank	Function Name	Peripheral Instance Name
1	SystemClock_Config	RCC
2	MX_GPIO_Init	GPIO
3	MX_TIM2_Init	TIM2

6. Power Consumption Calculator report

6.1. Microcontroller Selection

Series	STM32F1
Line	STM32F103
MCU	STM32F103C6Tx
Datasheet	DS5936_Rev7

6.2. Parameter Selection

Temperature	25
Vdd	3.3

6.3. Battery Selection

Battery	Li-SOCL2(A3400)
Capacity	3400.0 mAh
Self Discharge	0.08 %/month
Nominal Voltage	3.6 V
Max Cont Current	100.0 mA
Max Pulse Current	200.0 mA
Cells in series	1
Cells in parallel	1

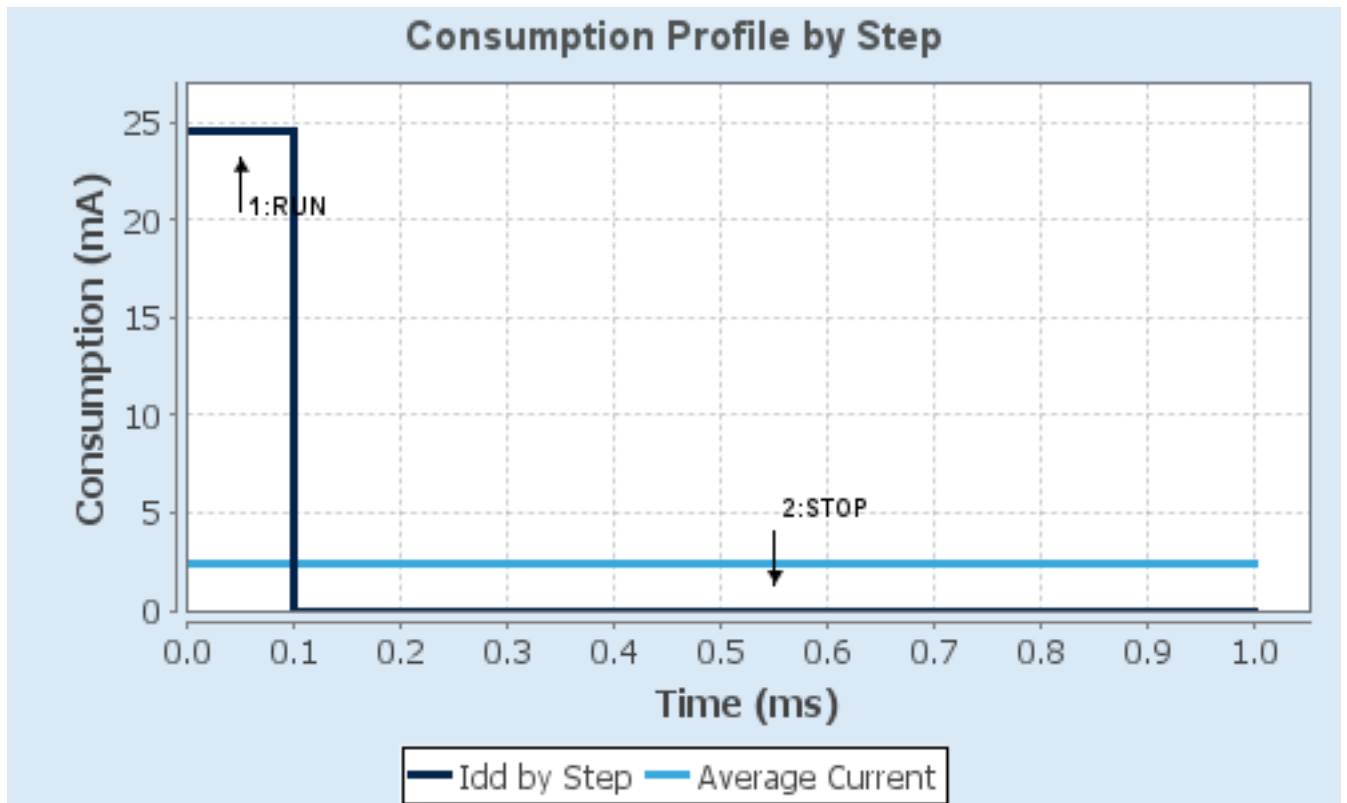
6.4. Sequence

Step	Step1	Step2
Mode	RUN	STOP
Vdd	3.3	3.3
Voltage Source	Battery	Battery
Range	No Scale	No Scale
Fetch Type	FLASH	n/a
CPU Frequency	72 MHz	0 Hz
Clock Configuration	HSE PLL	Regulator LP
Clock Source Frequency	8 MHz	0 Hz
Peripherals		
Additional Cons.	0 mA	0 mA
Average Current	24.5 mA	11.7 μ A
Duration	0.1 ms	0.9 ms
DMIPS	90.0	0.0
Ta Max	100.55	105
Category	In DS Table	In DS Table

6.5. Results

Sequence Time	1 ms	Average Current	2.46 mA
Battery Life	1 month, 27 days, 1 hour	Average DMIPS	61.0 DMIPS

6.6. Chart



7. Peripherals and Middlewares Configuration

7.1. RCC

7.1.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Prefetch Buffer	Enabled
Flash Latency(WS)	0 WS (1 CPU cycle)

RCC Parameters:

HSI Calibration Value	16
HSE Startup Timeout Value (ms)	100
LSE Startup Timeout Value (ms)	5000

7.2. SYS

Debug: Serial Wire

Timebase Source: SysTick

7.3. TIM2

Clock Source : Internal Clock

7.3.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	7999 *
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	9 *
Internal Clock Division (CKD)	No Division
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit)	Disable (Trigger input effect not delayed)
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

*** User modified value**

8. System Configuration

8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
GPIO	PA1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	RED_0
	PA2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	GREEN_0
	PA3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	YELLOW_0
	PA4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	RED_1
	PA5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	GREEN_1
	PA6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	YELLOW_1
	PB0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SEG_A
	PB1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SEG_B
	PB2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SEG_C
	PB10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	EN1_RIGHT
	PB11	GPIO_Input	Input mode	Pull-up *	n/a	BUTTON_1
	PB12	GPIO_Input	Input mode	Pull-up *	n/a	BUTTON_2
	PB13	GPIO_Input	Input mode	Pull-up *	n/a	BUTTON_3
	PB3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SEG_D
	PB4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SEG_E
	PB5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SEG_F
	PB6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SEG_G
	PB7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	EN0_LEFT
	PB8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	EN0_RIGHT
	PB9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	EN1_LEFT

8.2. DMA configuration

nothing configured in DMA service

8.3. NVIC configuration

8.3.1. NVIC

Interrupt Table	Enable	Preenmption Priority	SubPriority
Non maskable interrupt	true	0	0
Hard fault interrupt	true	0	0
Memory management fault	true	0	0
Prefetch fault, memory access fault	true	0	0
Undefined instruction or illegal state	true	0	0
System service call via SWI instruction	true	0	0
Debug monitor	true	0	0
Pendable request for system service	true	0	0
System tick timer	true	15	0
TIM2 global interrupt	true	0	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		

8.3.2. NVIC Code generation

Enabled interrupt Table	Select for init sequence ordering	Generate IRQ handler	Call HAL handler
Non maskable interrupt	false	true	false
Hard fault interrupt	false	true	false
Memory management fault	false	true	false
Prefetch fault, memory access fault	false	true	false
Undefined instruction or illegal state	false	true	false
System service call via SWI instruction	false	true	false
Debug monitor	false	true	false
Pendable request for system service	false	true	false
System tick timer	false	true	true
TIM2 global interrupt	false	true	true

* User modified value

9. System Views

9.1. Category view

9.1.1. Current

Middleware

System Core

Analog

Timers

Connectivity

Computing

DMA

TIM2 

GPIO 

IVIC 

RCC 

SYS 

10. Docs & Resources

Type	Link
Datasheet	http://www.st.com/resource/en/datasheet/CD00210843.pdf
Reference manual	http://www.st.com/resource/en/reference_manual/CD00171190.pdf
Programming manual	http://www.st.com/resource/en/programming_manual/CD00228163.pdf
Programming manual	http://www.st.com/resource/en/programming_manual/CD00283419.pdf
Errata sheet	http://www.st.com/resource/en/errata_sheet/CD00211391.pdf
Application note	http://www.st.com/resource/en/application_note/CD00160362.pdf
Application note	http://www.st.com/resource/en/application_note/CD00164185.pdf
Application note	http://www.st.com/resource/en/application_note/CD00167326.pdf
Application note	http://www.st.com/resource/en/application_note/CD00167594.pdf
Application note	http://www.st.com/resource/en/application_note/CD00211314.pdf
Application note	http://www.st.com/resource/en/application_note/CD00249778.pdf
Application note	http://www.st.com/resource/en/application_note/CD00259245.pdf
Application note	http://www.st.com/resource/en/application_note/CD00264321.pdf
Application note	http://www.st.com/resource/en/application_note/CD00264342.pdf
Application note	http://www.st.com/resource/en/application_note/CD00264379.pdf
Application note	http://www.st.com/resource/en/application_note/DM00024853.pdf
Application note	http://www.st.com/resource/en/application_note/DM00032987.pdf
Application note	http://www.st.com/resource/en/application_note/DM00033267.pdf
Application note	http://www.st.com/resource/en/application_note/DM00033344.pdf
Application note	http://www.st.com/resource/en/application_note/DM00042534.pdf
Application note	http://www.st.com/resource/en/application_note/DM00052530.pdf
Application note	http://www.st.com/resource/en/application_note/DM00073742.pdf
Application note	http://www.st.com/resource/en/application_note/DM00080497.pdf
Application note	http://www.st.com/resource/en/application_note/DM00129215.pdf

Application note http://www.st.com/resource/en/application_note/DM00156964.pdf
Application note http://www.st.com/resource/en/application_note/DM00160482.pdf
Application note http://www.st.com/resource/en/application_note/DM00209695.pdf
Application note http://www.st.com/resource/en/application_note/DM00220769.pdf
Application note http://www.st.com/resource/en/application_note/DM00236305.pdf
Application note http://www.st.com/resource/en/application_note/DM00257177.pdf
Application note http://www.st.com/resource/en/application_note/DM00272912.pdf
Application note http://www.st.com/resource/en/application_note/DM00296349.pdf
Application note http://www.st.com/resource/en/application_note/DM00315319.pdf
Application note http://www.st.com/resource/en/application_note/DM00325582.pdf
Application note http://www.st.com/resource/en/application_note/DM00327191.pdf
Application note http://www.st.com/resource/en/application_note/DM00354244.pdf
Application note http://www.st.com/resource/en/application_note/DM00380469.pdf
Application note http://www.st.com/resource/en/application_note/DM00395696.pdf
Application note http://www.st.com/resource/en/application_note/DM00493651.pdf
Application note http://www.st.com/resource/en/application_note/DM00536349.pdf
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