
STM32
CubeMX

1. Description

1.1. Project

Project Name	IR4DetacherFirmware
Board Name	custom
Generated with:	STM32CubeMX 6.11.1
Date	03/24/2025

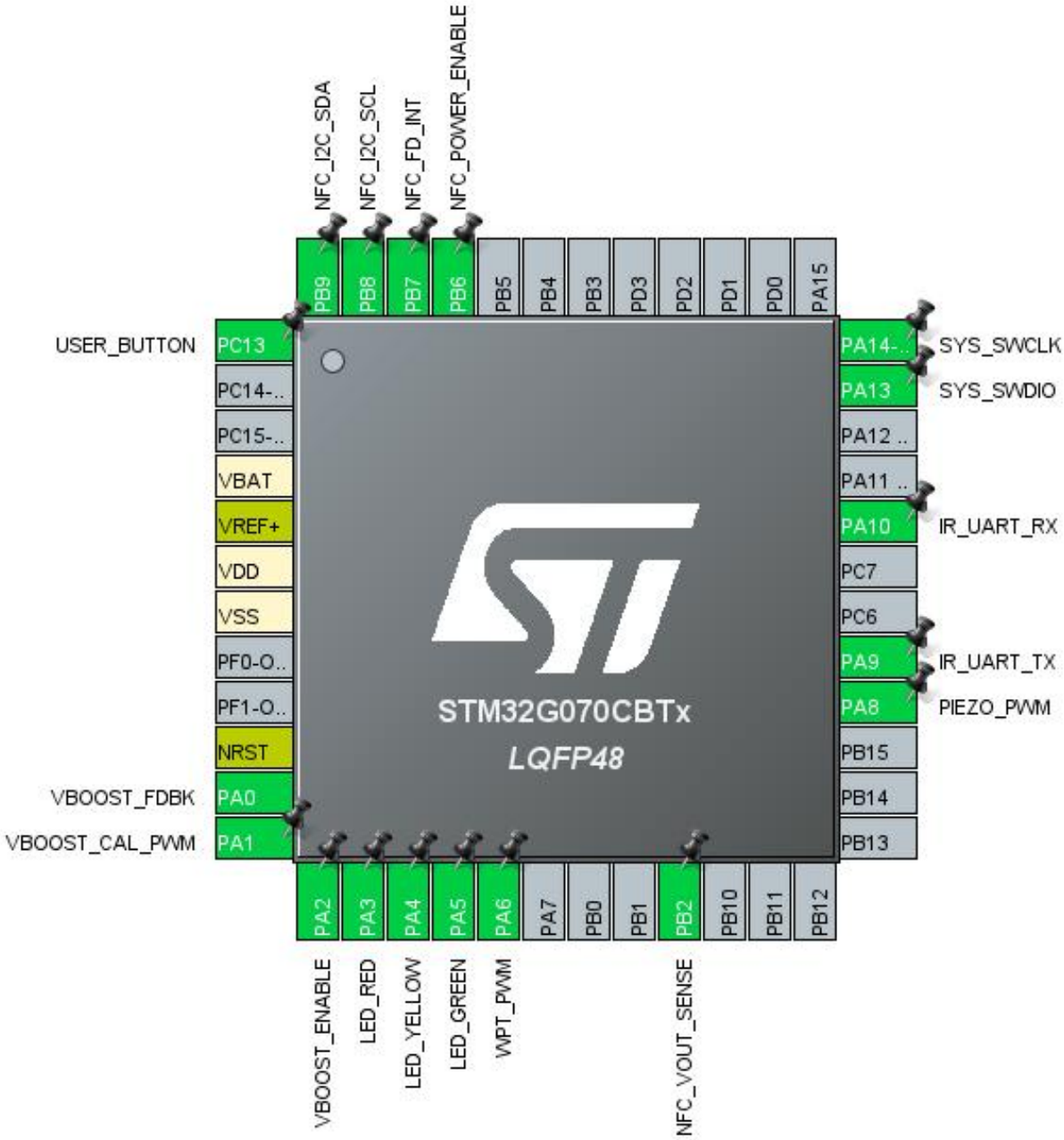
1.2. MCU

MCU Series	STM32G0
MCU Line	STM32G0x0 Value line
MCU name	STM32G070CBTx
MCU Package	LQFP48
MCU Pin number	48

1.3. Core(s) information

Core(s)	ARM Cortex-M0+

2. Pinout Configuration

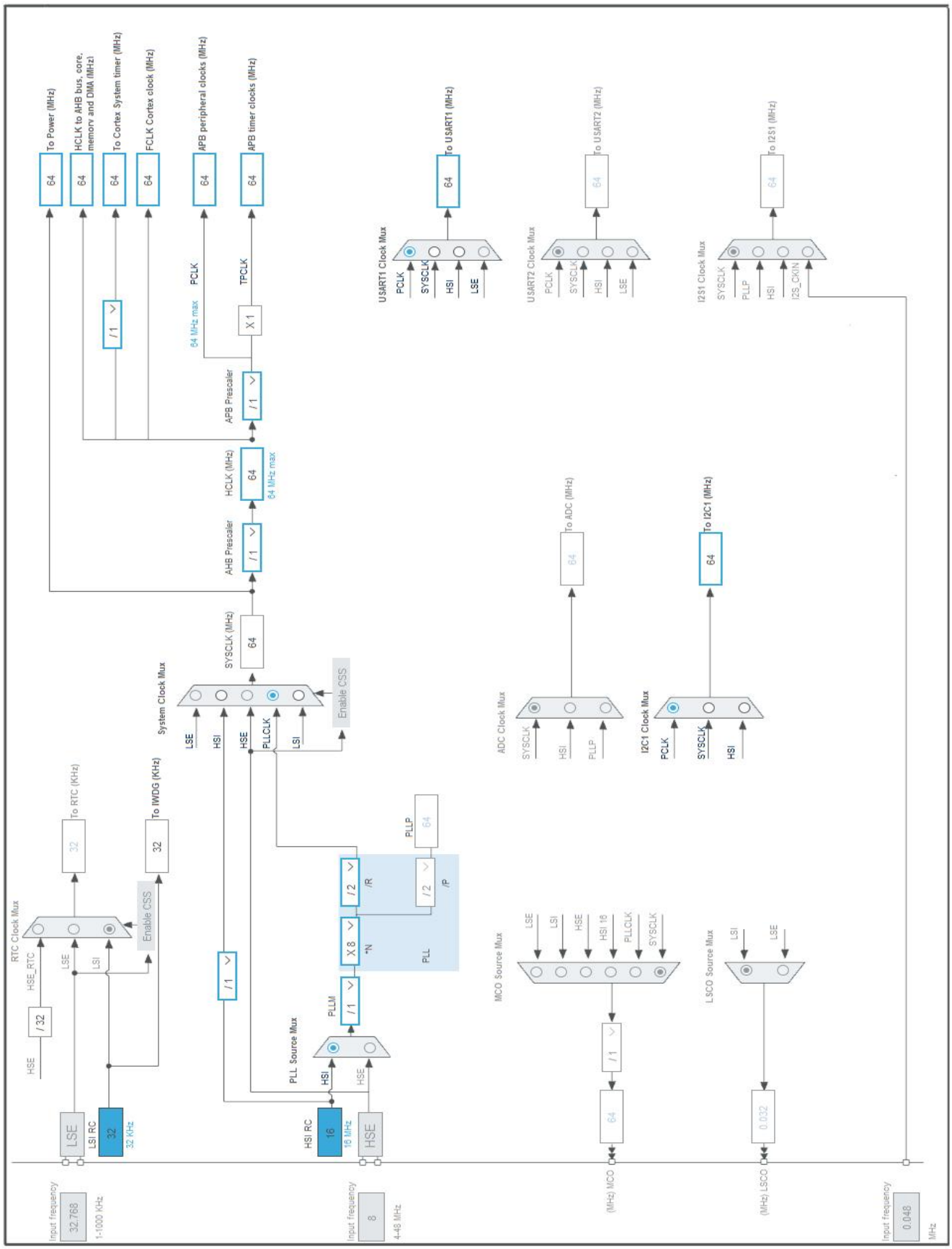


3. Pins Configuration

Pin Number LQFP48	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	PC13 *	I/O	GPIO_Input	USER_BUTTON
4	VBAT	Power		
5	VREF+	MonoIO		
6	VDD	Power		
7	VSS	Power		
10	NRST	Reset		
11	PA0	I/O	ADC1_IN0	VBOOST_FDBK
12	PA1	I/O	TIM15_CH1N	VBOOST_CAL_PWM
13	PA2 *	I/O	GPIO_Output	VBOOST_ENABLE
14	PA3 *	I/O	GPIO_Output	LED_RED
15	PA4 *	I/O	GPIO_Output	LED_YELLOW
16	PA5 *	I/O	GPIO_Output	LED_GREEN
17	PA6	I/O	TIM3_CH1	WPT_PWM
21	PB2	I/O	ADC1_IN10	NFC_VOUT_SENSE
28	PA8	I/O	TIM1_CH1	PIEZO_PWM
29	PA9	I/O	USART1_TX	IR_UART_TX
32	PA10	I/O	USART1_RX	IR_UART_RX
35	PA13	I/O	SYS_SWDIO	
36	PA14-BOOT0	I/O	SYS_SWCLK	
45	PB6 *	I/O	GPIO_Output	NFC_POWER_ENABLE
46	PB7	I/O	GPIO_EXTI7	NFC_FD_INT
47	PB8	I/O	I2C1_SCL	NFC_I2C_SCL
48	PB9	I/O	I2C1_SDA	NFC_I2C_SDA

* The pin is affected with an I/O function

4. Clock Tree Configuration



5. Software Project

5.1. Project Settings

Name	Value
Project Name	IR4DetacherFirmware
Project Folder	C:\Users\jpieterick\Desktop\Projects\F1888IR4OneKeyDetacher\firmware\F18888
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_G0 V1.6.2
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	Yes
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)	Yes
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_I2C1_Init	I2C1
4	MX_USART1_UART_Init	USART1
5	MX_TIM1_Init	TIM1
6	MX_TIM3_Init	TIM3
7	MX_ADC1_Init	ADC1
8	MX_IWDG_Init	IWDG
9	MX_TIM15_Init	TIM15

1. Power Consumption Calculator report

1.1. Microcontroller Selection

Series	STM32G0
Line	STM32G0x0 Value line
MCU	STM32G070CBTx
Datasheet	DS12766_Rev0

1.2. Parameter Selection

Temperature	25
Vdd	3.0

1.3. Battery Selection

Battery	Li-SOCL2(AAA700)
Capacity	700.0 mAh
Self Discharge	0.08 %/month
Nominal Voltage	3.6 V
Max Cont Current	10.0 mA
Max Pulse Current	30.0 mA
Cells in series	1
Cells in parallel	1

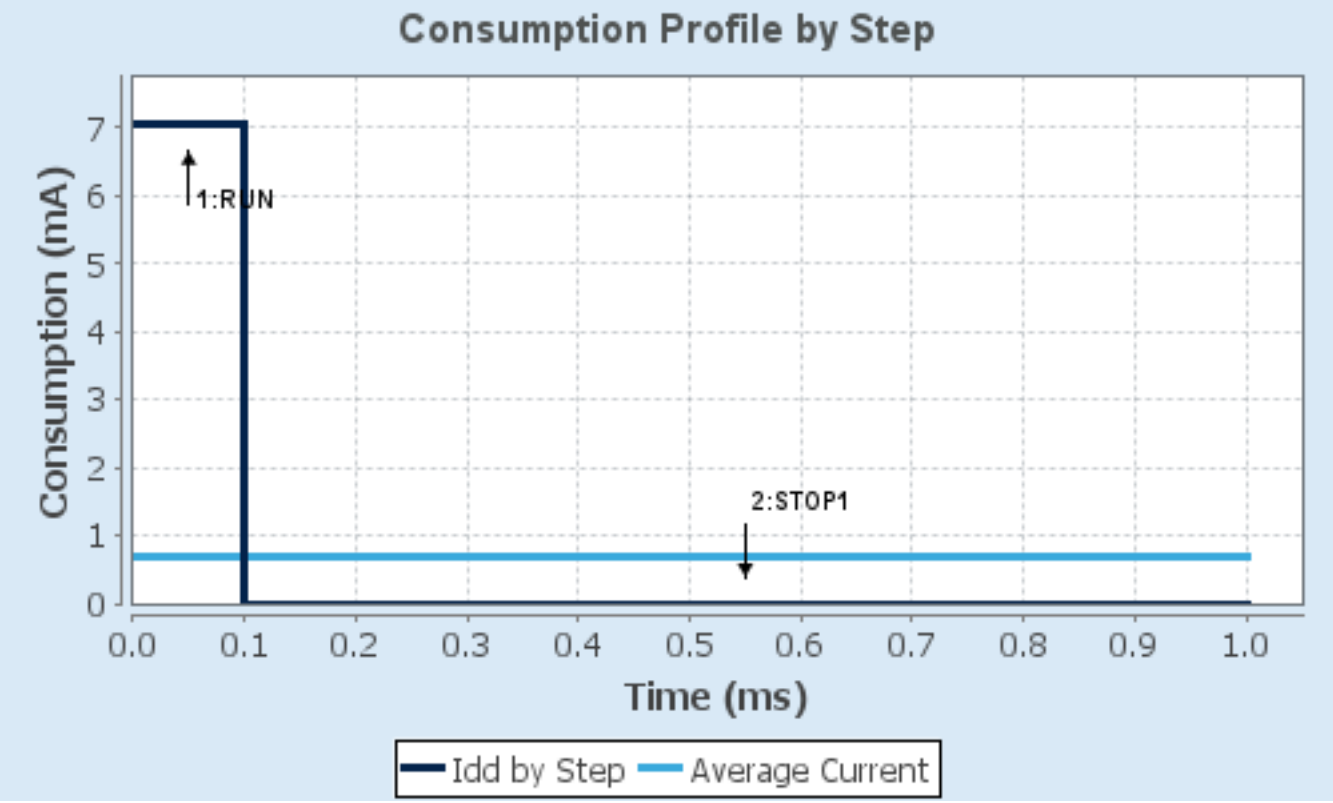
1.4. Sequence

Step	Step1	Step2
Mode	RUN	STOP1
Vdd	3.0	3.0
Voltage Source	Battery	Battery
Range	Range1-High	NoRange
Fetch Type	FLASH	Flash-PowerDown
CPU Frequency	64 MHz	16 MHz
Clock Configuration	HSI PLL	HSI
Clock Source Frequency	16 MHz	16 MHz
Peripherals		
Additional Cons.	0 mA	0 mA
Average Current	7.04 mA	3.74 µA
Duration	0.1 ms	0.9 ms
DMIPS	80.0	0.0
Ta Max	128.42	130
Category	In DS Table	In DS Table

1.5. Results

Sequence Time	1 ms	Average Current	707.37 µA
Battery Life	1 month, 10 days, 18 hours	Average DMIPS	80.0 DMIPS

1.6. Chart


Consumption Profile by Step
Consumption (mA)
7
6
5
4
3
2
1
0
1:RUN
2:STOP1
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
Time (ms)
Idd by Step
Average Current

2. Peripherals and Middlewares Configuration

2.1. ADC1

mode: IN0

mode: IN10

2.1.1. Parameter Settings:

ADC_Settings:

Clock Prescaler	Synchronous clock mode divided by 2
Resolution	ADC 12-bit resolution
Data Alignment	Right alignment
Sequencer	Sequencer set to fully configurable
Scan Conversion Mode	Disabled
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	Disabled
End Of Conversion Selection	End of single conversion
Overrun behaviour	Overrun data preserved
Low Power Auto Wait	Disabled
Auto Off	Disabled
Oversampling Mode	Disabled

ADC_Regular_ConversionMode:

SamplingTime Common 1	1.5 Cycles
SamplingTime Common 2	1.5 Cycles
Number Of Conversion	1
External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None
Trigger Frequency	High frequency
Rank	1
Channel	Channel 0
Sampling Time	Sampling time common 1

Analog Watchdog 1:

Enable Analog WatchDog1 Mode	false

Analog Watchdog 2:

Enable Analog WatchDog2 Mode	false

Analog Watchdog 3:

Enable Analog WatchDog3 Mode	false

2.2. I2C1

I2C: I2C

2.2.1. Parameter Settings:

Timing configuration:

Custom Timing	Disabled
I2C Speed Mode	Standard Mode
I2C Speed Frequency (KHz)	100
Rise Time (ns)	0
Fall Time (ns)	0
Coefficient of Digital Filter	0
Analog Filter	Enabled
Timing	**0x10707DBC ***

Slave Features:

Clock No Stretch Mode	Disabled
General Call Address Detection	Disabled
Primary Address Length selection	7-bit
Dual Address Acknowledged	Disabled
Primary slave address	0

2.3. IWDG

mode: Activated

2.3.1. Parameter Settings:

Watchdog Clocking:

IWDG counter clock prescaler	4
IWDG window value	4095
IWDG down-counter reload value	4095

2.4. RCC

2.4.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Enabled
Data Cache	Enabled

Flash Latency(WS)	2 WS (3 CPU cycle)

RCC Parameters:

HSI Calibration Value	64
HSE Startup Timout Value (ms)	100
LSE Startup Timout Value (ms)	5000

Power Parameters:

Power Regulator Voltage Scale	Power Regulator Voltage Scale 1

Peripherals Clock Configuration:

Generate the peripherals clock configuration	TRUE

2.5. SYS

mode: Debug

Timebase Source: SysTick

mode: save power of non-active UCPD - deactive Dead Battery pull-up

2.6. TIM1

Clock Source : Internal Clock

Channel1: PWM Generation CH1

2.6.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	65535
Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 16 bits value)	0
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit)	Disable (Trigger input effect not delayed)
Trigger Event Selection TRGO	Reset (UG bit from TIMx_EGR)
Trigger Event Selection TRGO2	Reset (UG bit from TIMx_EGR)

Break And Dead Time management - BRK Configuration:

BRK State	Disable
BRK Polarity	High
BRK Filter (4 bits value)	0
BRK Sources Configuration	
- Digital Input	Disable

Break And Dead Time management - BRK2 Configuration:

BRK2 State	Disable
BRK2 Polarity	High
BRK2 Filter (4 bits value)	0
BRK2 Sources Configuration	
- Digital Input	Disable

Break And Dead Time management - Output Configuration:

Automatic Output State	Disable
Off State Selection for Run Mode (OSSR)	Disable
Off State Selection for Idle Mode (OSSI)	Disable
Lock Configuration	Off

Clear Input:

Clear Input Source	Disable

PWM Generation Channel 1:

Mode	PWM mode 1
Pulse (16 bits value)	0
Output compare preload	Enable
Fast Mode	Disable
CH Polarity	High
CH Idle State	Reset

2.7. TIM3

Clock Source : Internal Clock

Channel1: PWM Generation CH1

2.7.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	65535
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 TRGO	Reset (UG bit from TIMx_EGR)

Clear Input:

Clear Input Source	Disable

PWM Generation Channel 1:

Mode	PWM mode 1
Pulse (16 bits value)	0

Output compare preload	Enable
Fast Mode	Disable
CH Polarity	High

2.8. TIM15

Channel1: PWM Generation CH1N

2.8.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	65535
Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 8 bits value)	0
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)

Break And Dead Time management - BRK Configuration:

BRK State	Disable
BRK Polarity	High
BRK Filter (4 bits value)	0
BRK Sources Configuration	
- Digital Input	Disable

Break And Dead Time management - Output Configuration:

Automatic Output State	Disable
Off State Selection for Run Mode (OSSR)	Disable
Off State Selection for Idle Mode (OSSI)	Disable
Lock Configuration	Off

PWM Generation Channel 1N:

Mode	PWM mode 1
Pulse (16 bits value)	0
Output compare preload	Enable
Fast Mode	Disable
CHN Polarity	High
CHN Idle State	Reset

2.9. USART1

Mode: Asynchronous

2.9.1. Parameter Settings:

Basic Parameters:

Baud Rate	**6553 ***
Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples
Single Sample	Disable
ClockPrescaler	1
Fifo Mode	Disable
Txfifo Threshold	1 eighth full configuration
Rxfifo Threshold	1 eighth full configuration

Advanced Features:

Auto Baudrate	Disable
TX Pin Active Level Inversion	Disable
RX Pin Active Level Inversion	Disable
Data Inversion	Disable
TX and RX Pins Swapping	Disable
Overrun	Enable
DMA on RX Error	Enable
MSB First	Disable

*** User modified value**

3. System Configuration

3.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
ADC1	PA0	ADC1_IN0	Analog mode	No pull-up and no pull-down	n/a	VBOOST_FDBK
	PB2	ADC1_IN10	Analog mode	No pull-up and no pull-down	n/a	NFC_VOUT_SENSE
I2C1	PB8	I2C1_SCL	Alternate Function Open Drain	No pull-up and no pull-down	Low	NFC_I2C_SCL
	PB9	I2C1_SDA	Alternate Function Open Drain	No pull-up and no pull-down	Low	NFC_I2C_SDA
SYS	PA13	SYS_SWDIO	n/a	n/a	n/a	
	PA14-BOOT0	SYS_SWCLK	n/a	n/a	n/a	
TIM1	PA8	TIM1_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	PIEZO_PWM
TIM3	PA6	TIM3_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	WPT_PWM
TIM15	PA1	TIM15_CH1N	Alternate Function Push Pull	No pull-up and no pull-down	Low	VBOOST_CAL_PWM
USART1	PA9	USART1_TX	Alternate Function Push Pull	No pull-up and no pull-down	Low	IR_UART_TX
	PA10	USART1_RX	Alternate Function Push Pull	No pull-up and no pull-down	Low	IR_UART_RX
GPIO	PC13	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	USER_BUTTON
	PA2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	VBOOST_ENABLE
	PA3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_RED
	PA4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_YELLOW
	PA5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_GREEN
	PB6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	NFC_POWER_ENABLE
	PB7	GPIO_EXTI7	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	NFC_FD_INT

3.2. DMA configuration

nothing configured in DMA service

3.3. NVIC configuration

3.3.1. NVIC

Interrupt Table	Enable	Preenmption Priority	SubPriority
Non maskable interrupt	true	0	0
Hard fault interrupt	true	0	0
System service call via SWI instruction	true	0	0
Pendable request for system service	true	0	0
System tick timer	true	3	0
EXTI line 4 to 15 interrupts	true	0	0
ADC1 interrupt	true	0	0
USART1 global interrupt / USART1 wake-up interrupt through EXTI line 25	true	1	0
Flash global interrupt	unused		
RCC global interrupt	unused		
TIM1 break, update, trigger and commutation interrupts	unused		
TIM1 capture compare interrupt	unused		
TIM3 global interrupt	unused		
TIM15 global interrupt	unused		
I2C1 event global interrupt / I2C1 wake-up interrupt through EXTI line 23	unused		

3.3.2. NVIC Code generation

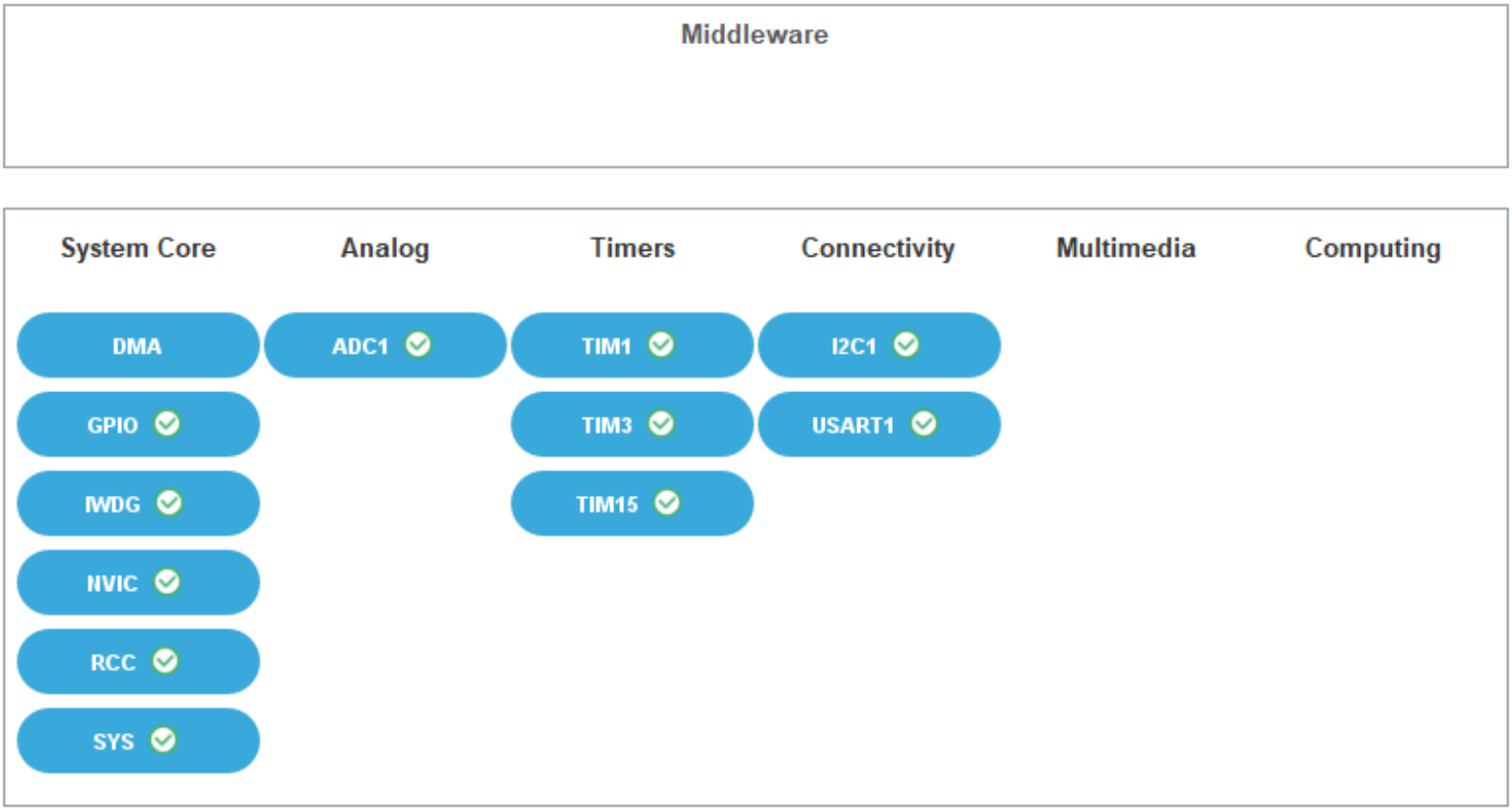
Enabled interrupt Table	Select for init sequence ordering	Generate IRQ handler	Call HAL handler
Non maskable interrupt	false	true	false
Hard fault interrupt	false	true	false
System service call via SWI instruction	false	true	false
Pendable request for system service	false	true	false
System tick timer	false	true	true
EXTI line 4 to 15 interrupts	false	true	true
ADC1 interrupt	false	true	true
USART1 global interrupt / USART1 wake-up interrupt through EXTI line 25	false	true	true

*** User modified value**

4. System Views

4.1. Category view

4.1.1. Current



5. Docs & Resources

Type	Link