1. Description

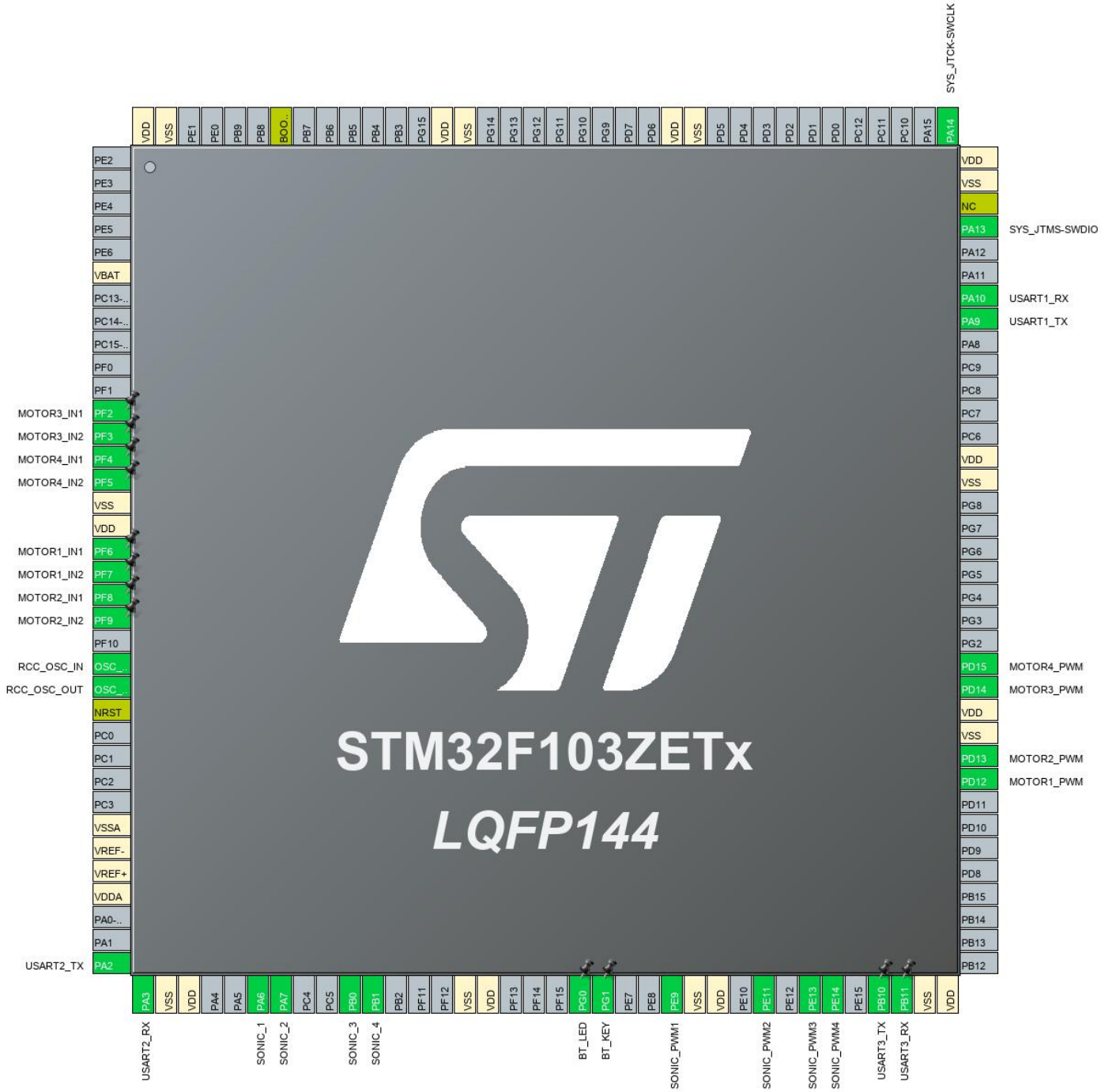
1.1. Project

Project Name	BlueTooth
Board Name	custom
Generated with:	STM32CubeMX 5.6.0
Date	03/19/2020

1.2. MCU

MCU Series	STM32F1
MCU Line	STM32F103
MCU name	STM32F103ZETx
MCU Package	LQFP144
MCU Pin number	144

2. Pinout Configuration



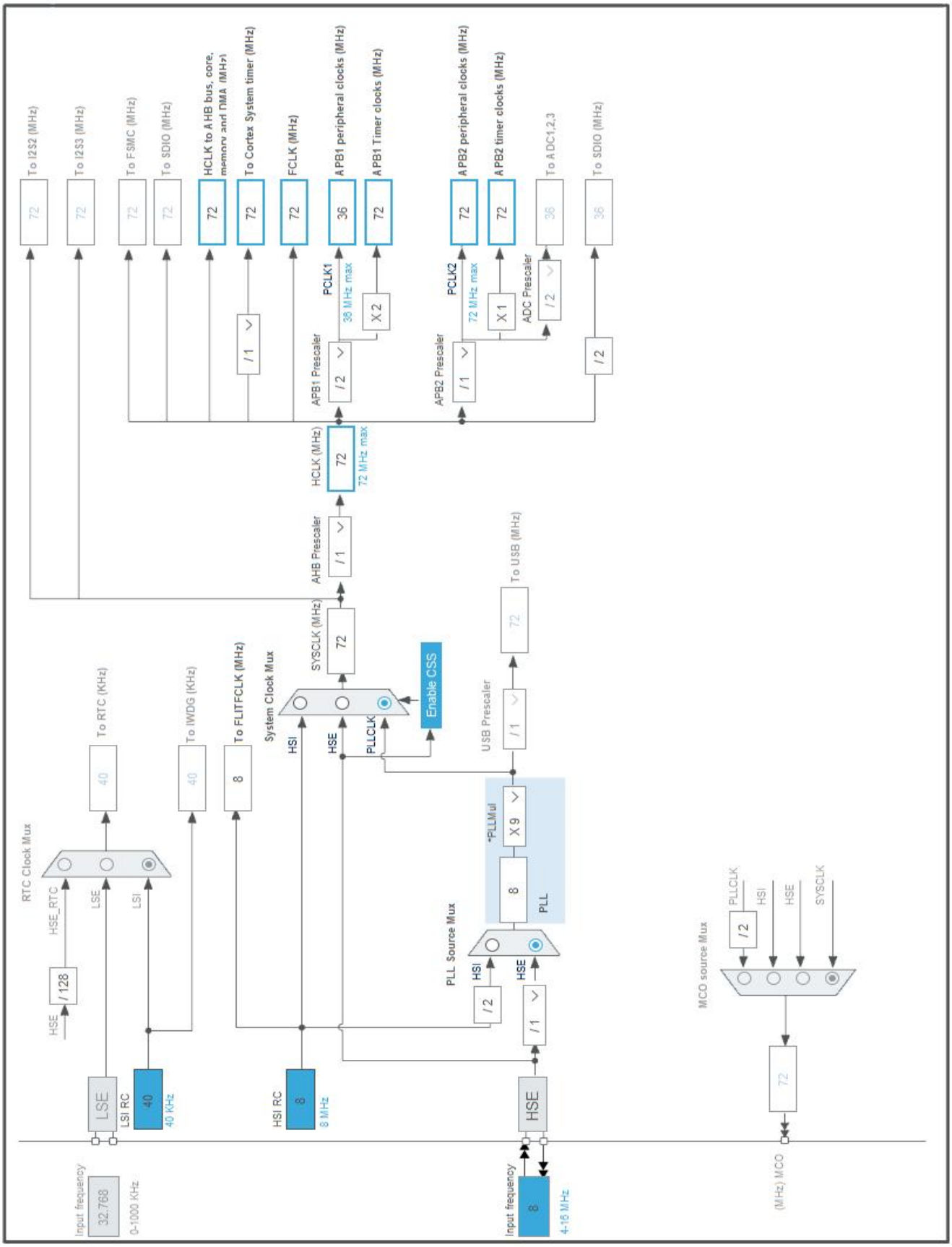
3. Pins Configuration

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
6	VBAT	Power		
12	PF2 *	I/O	GPIO_Output	MOTOR3_IN1
13	PF3 *	I/O	GPIO_Output	MOTOR3_IN2
14	PF4 *	I/O	GPIO_Output	MOTOR4_IN1
15	PF5 *	I/O	GPIO_Output	MOTOR4_IN2
16	VSS	Power		
17	VDD	Power		
18	PF6 *	I/O	GPIO_Output	MOTOR1_IN1
19	PF7 *	I/O	GPIO_Output	MOTOR1_IN2
20	PF8 *	I/O	GPIO_Output	MOTOR2_IN1
21	PF9 *	I/O	GPIO_Output	MOTOR2_IN2
23	OSC_IN	I/O	RCC_OSC_IN	
24	OSC_OUT	I/O	RCC_OSC_OUT	
25	NRST	Reset		
30	VSSA	Power		
31	VREF-	Power		
32	VREF+	Power		
33	VDDA	Power		
36	PA2	I/O	USART2_TX	
37	PA3	I/O	USART2_RX	
38	VSS	Power		
39	VDD	Power		
42	PA6	I/O	TIM3_CH1	SONIC_1
43	PA7	I/O	TIM3_CH2	SONIC_2
46	PB0	I/O	TIM3_CH3	SONIC_3
47	PB1	I/O	TIM3_CH4	SONIC_4
51	VSS	Power		
52	VDD	Power		
56	PG0 *	I/O	GPIO_Input	BT_LED
57	PG1 *	I/O	GPIO_Output	BT_KEY
60	PE9	I/O	TIM1_CH1	SONIC_PWM1
61	VSS	Power		
62	VDD	Power		
64	PE11	I/O	TIM1_CH2	SONIC_PWM2
66	PE13	I/O	TIM1_CH3	SONIC_PWM3
67	PE14	I/O	TIM1_CH4	SONIC_PWM4

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
69	PB10	I/O	USART3_TX	
70	PB11	I/O	USART3_RX	
71	VSS	Power		
72	VDD	Power		
81	PD12	I/O	TIM4_CH1	MOTOR1_PWM
82	PD13	I/O	TIM4_CH2	MOTOR2_PWM
83	VSS	Power		
84	VDD	Power		
85	PD14	I/O	TIM4_CH3	MOTOR3_PWM
86	PD15	I/O	TIM4_CH4	MOTOR4_PWM
94	VSS	Power		
95	VDD	Power		
101	PA9	I/O	USART1_TX	
102	PA10	I/O	USART1_RX	
105	PA13	I/O	SYS_JTMS-SWDIO	
106	NC	NC		
107	VSS	Power		
108	VDD	Power		
109	PA14	I/O	SYS_JTCK-SWCLK	
120	VSS	Power		
121	VDD	Power		
130	VSS	Power		
131	VDD	Power		
138	BOOT0	Boot		
143	VSS	Power		
144	VDD	Power		

* The pin is affected with an I/O function

4. Clock Tree Configuration



5. Software Project

5.1. Project Settings

Name	Value
Project Name	BlueTooth
Project Folder	C:\Users\ZZDirty\CLionProject\BlueTooth
Toolchain / IDE	SW4STM32
Firmware Package Name and Version	STM32Cube FW_F1 V1.8.0

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
Delete previously generated files when not re-generated	Yes
Set all free pins as analog (to optimize the power consumption)	No

6. Power Consumption Calculator report

6.1. Microcontroller Selection

Series	STM32F1
Line	STM32F103
MCU	STM32F103ZETx
Datasheet	14611 Rev12

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

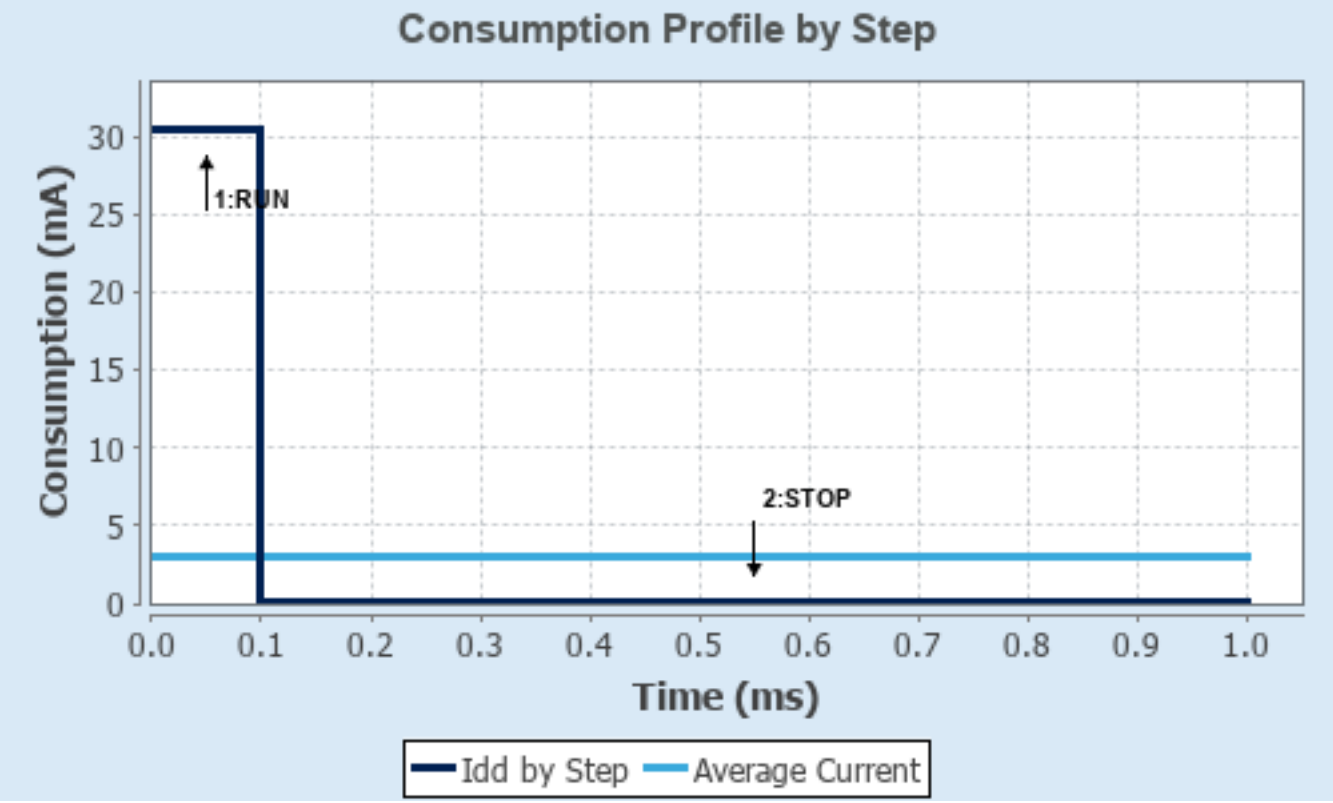
6.4. Sequence

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	30.5 mA	25 µA
Duration	0.1 ms	0.9 ms
DMIPS	90.0	0.0
Ta Max	101.98	105
Category	In DS Table	In DS Table

6.5. RESULTS

Sequence Time	1 ms	Average Current	3.07 mA
Battery Life	1 month, 15 days, 15 hours	Average DMIPS	61.0 DMIPS

6.6. Chart


Consumption Profile by Step
Consumption (mA)
30
25
20
15
10
5
0
1:RUN
2:STOP
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

7. IPs and Middleware Configuration

7.1. GPIO

7.2. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

7.2.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Prefetch Buffer	Enabled
Flash Latency(WS)	2 WS (3 CPU cycle)

RCC Parameters:

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

7.3. SYS

Debug: Serial Wire

Timebase Source: SysTick

7.4. TIM1

Clock Source : Internal Clock

Channel1: PWM Generation CH1

Channel2: PWM Generation CH2

Channel3: PWM Generation CH3

Channel4: PWM Generation CH4

7.4.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**719 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**49999 ***
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

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 1:

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

PWM Generation Channel 2:

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

PWM Generation Channel 3:

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

PWM Generation Channel 4:

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

7.5. TIM3

Clock Source : Internal Clock

Channel1: Input Capture direct mode

Channel2: Input Capture direct mode

Channel3: Input Capture direct mode

Channel4: Input Capture direct mode

7.5.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**71 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**499 ***
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)

Input Capture Channel 1:

Polarity Selection	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter (4 bits value)	0

Input Capture Channel 2:

Polarity Selection	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter (4 bits value)	0

Input Capture Channel 3:

Polarity Selection	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter (4 bits value)	0

Input Capture Channel 4:

Polarity Selection	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter (4 bits value)	0

7.6. TIM4

Clock Source : Internal Clock

Channel1: PWM Generation CH1

Channel2: PWM Generation CH2

Channel3: PWM Generation CH3

Channel4: PWM Generation CH4

7.6.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**71 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**499 ***
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)

PWM Generation Channel 1:

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

PWM Generation Channel 2:

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

PWM Generation Channel 3:

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

PWM Generation Channel 4:

Mode	PWM mode 1

Pulse (16 bits value)	0
Output compare preload	Enable
Fast Mode	Disable
CH Polarity	High

7.7. USART1

Mode: Asynchronous

7.7.1. Parameter Settings:

Basic Parameters:

Baud Rate	115200
Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples

7.8. USART2

Mode: Asynchronous

7.8.1. Parameter Settings:

Basic Parameters:

Baud Rate	**38400 ***
Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples

7.9. USART3

Mode: Asynchronous

7.9.1. Parameter Settings:

Basic Parameters:

Baud Rate	**38400 ***
Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples

*** User modified value**

8. System Configuration

8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
RCC	OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	
	OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
TIM1	PE9	TIM1_CH1	Alternate Function Push Pull	n/a	Low	SONIC_PWM1
	PE11	TIM1_CH2	Alternate Function Push Pull	n/a	Low	SONIC_PWM2
	PE13	TIM1_CH3	Alternate Function Push Pull	n/a	Low	SONIC_PWM3
	PE14	TIM1_CH4	Alternate Function Push Pull	n/a	Low	SONIC_PWM4
TIM3	PA6	TIM3_CH1	Input mode	**Pull-down ***	n/a	SONIC_1
	PA7	TIM3_CH2	Input mode	**Pull-down ***	n/a	SONIC_2
	PB0	TIM3_CH3	Input mode	**Pull-down ***	n/a	SONIC_3
	PB1	TIM3_CH4	Input mode	**Pull-down ***	n/a	SONIC_4
TIM4	PD12	TIM4_CH1	Alternate Function Push Pull	n/a	Low	MOTOR1_PWM
	PD13	TIM4_CH2	Alternate Function Push Pull	n/a	Low	MOTOR2_PWM
	PD14	TIM4_CH3	Alternate Function Push Pull	n/a	Low	MOTOR3_PWM
	PD15	TIM4_CH4	Alternate Function Push Pull	n/a	Low	MOTOR4_PWM
USART1	PA9	USART1_TX	Alternate Function Push Pull	n/a	**High ***	
	PA10	USART1_RX	Input mode	No pull-up and no pull-down	**n/a**	
USART2	PA2	USART2_TX	Alternate Function Push Pull	n/a	**High ***	
	PA3	USART2_RX	Input mode	No pull-up and no pull-down	**n/a**	
USART3	PB10	USART3_TX	Alternate Function Push Pull	n/a	**High ***	
	PB11	USART3_RX	Input mode	No pull-up and no pull-down	**n/a**	
GPIO	PF2	GPIO_Output	Output Push Pull	**Pull-up ***	**Medium ***	MOTOR3_IN1
	PF3	GPIO_Output	Output Push Pull	**Pull-up ***	**Medium ***	MOTOR3_IN2
	PF4	GPIO_Output	Output Push Pull	**Pull-up ***	**Medium ***	MOTOR4_IN1
	PF5	GPIO_Output	Output Push Pull	**Pull-up ***	**Medium ***	MOTOR4_IN2
	PF6	GPIO_Output	Output Push Pull	**Pull-up ***	**Medium ***	MOTOR1_IN1
	PF7	GPIO_Output	Output Push Pull	**Pull-up ***	**Medium ***	MOTOR1_IN2
	PF8	GPIO_Output	Output Push Pull	**Pull-up ***	**Medium ***	MOTOR2_IN1
	PF9	GPIO_Output	Output Push Pull	**Pull-up ***	**Medium ***	MOTOR2_IN2
	PG0	GPIO_Input	Input mode			BT_LED

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
				Pull-up *	**n/a**	
	PG1	GPIO_Output	Output Push Pull	**Pull-up ***	**High ***	BT_KEY

8.2. DMA configuration

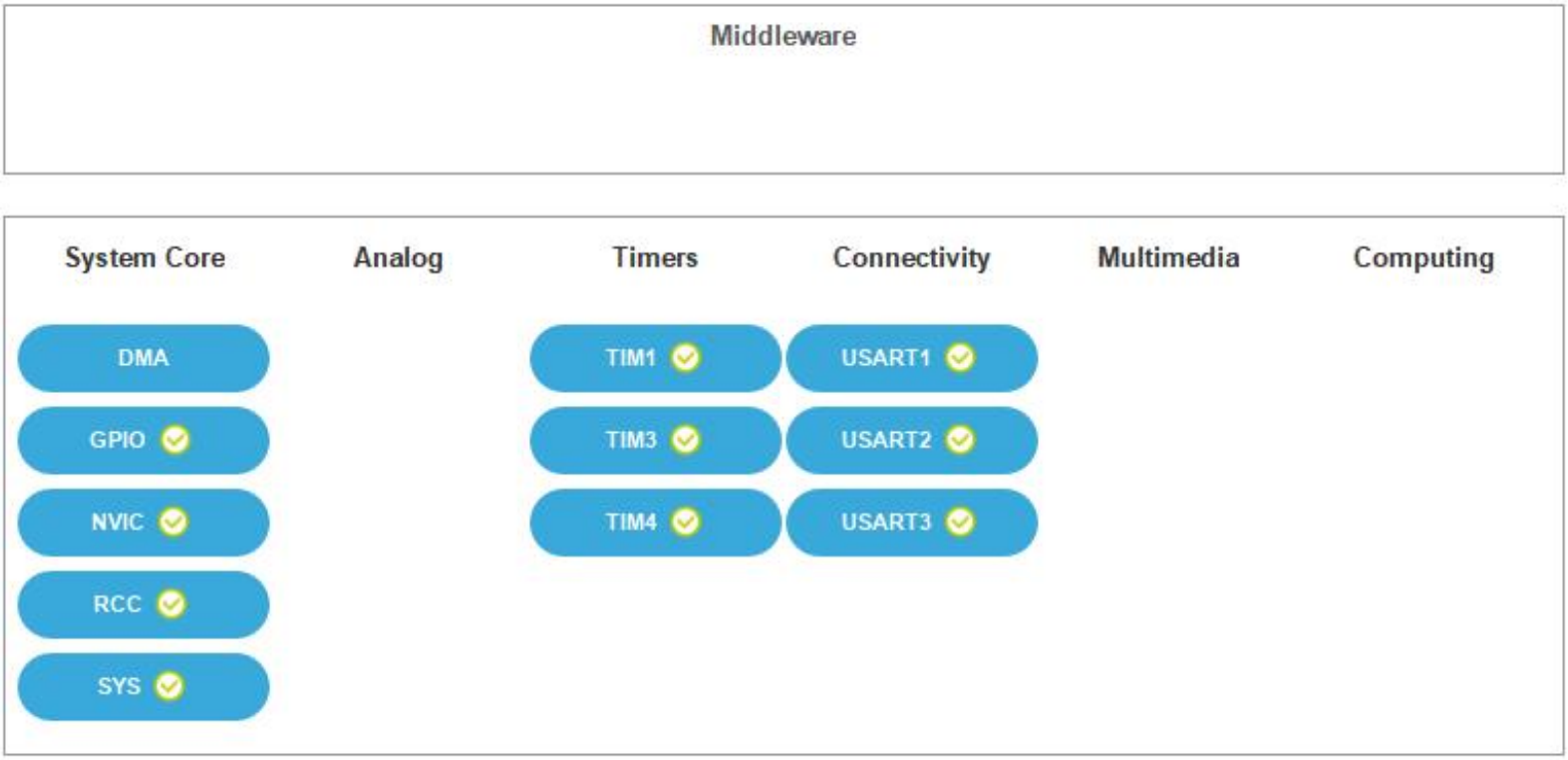
nothing configured in DMA service

8.3. NVIC configuration

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	0	0
TIM3 global interrupt	true	0	0
USART2 global interrupt	true	2	1
USART3 global interrupt	true	2	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
TIM1 break interrupt	unused		
TIM1 update interrupt	unused		
TIM1 trigger and commutation interrupts	unused		
TIM1 capture compare interrupt	unused		
TIM4 global interrupt	unused		
USART1 global interrupt	unused		

*** User modified value**

9. Predefined Views - Category view : Current



10. Software Pack Report