1. Description

1.1. Project

Project Name	heart
Board Name	heart
Generated with:	STM32CubeMX 4.25.0
Date	04/07/2018

1.2. MCU

MCU Series	STM32L0
MCU Line	STM32L0x1
MCU name	STM32L031F4Px
MCU Package	TSSOP20
MCU Pin number	20

2. Pinout Configuration
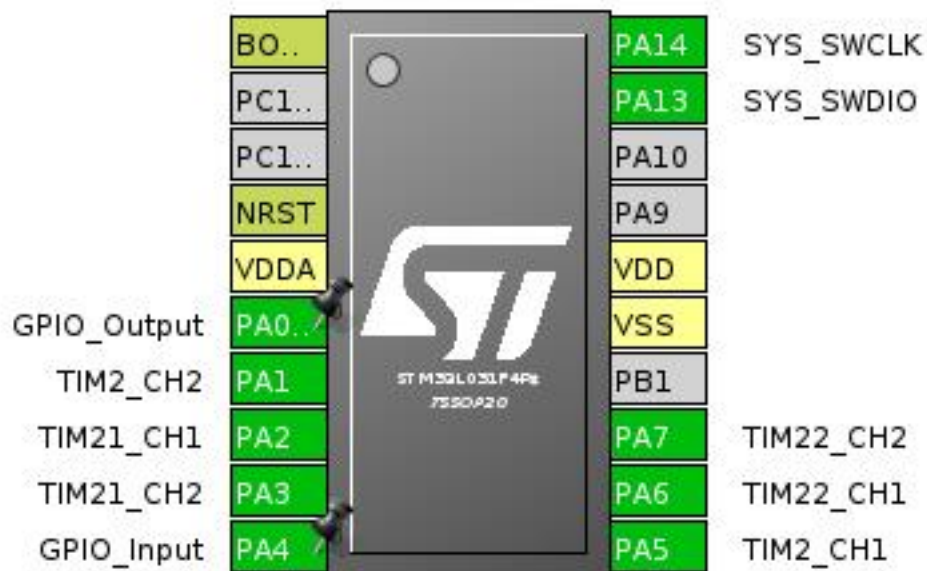
3. Pins Configuration

Pin Number TSSOP20	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	BOOT0	Boot		
4	NRST	Reset		
5	VDDA	Power		
6	PA0-CK_IN *	I/O	GPIO_Output	
7	PA1	I/O	TIM2_CH2	
8	PA2	I/O	TIM21_CH1	
9	PA3	I/O	TIM21_CH2	
10	PA4 *	I/O	GPIO_Input	
11	PA5	I/O	TIM2_CH1	
12	PA6	I/O	TIM22_CH1	
13	PA7	I/O	TIM22_CH2	
15	VSS	Power		
16	VDD	Power		
19	PA13	I/O	SYS_SWDIO	
20	PA14	I/O	SYS_SWCLK	

* The pin is affected with an I/O function

4. Clock Tree Configuration
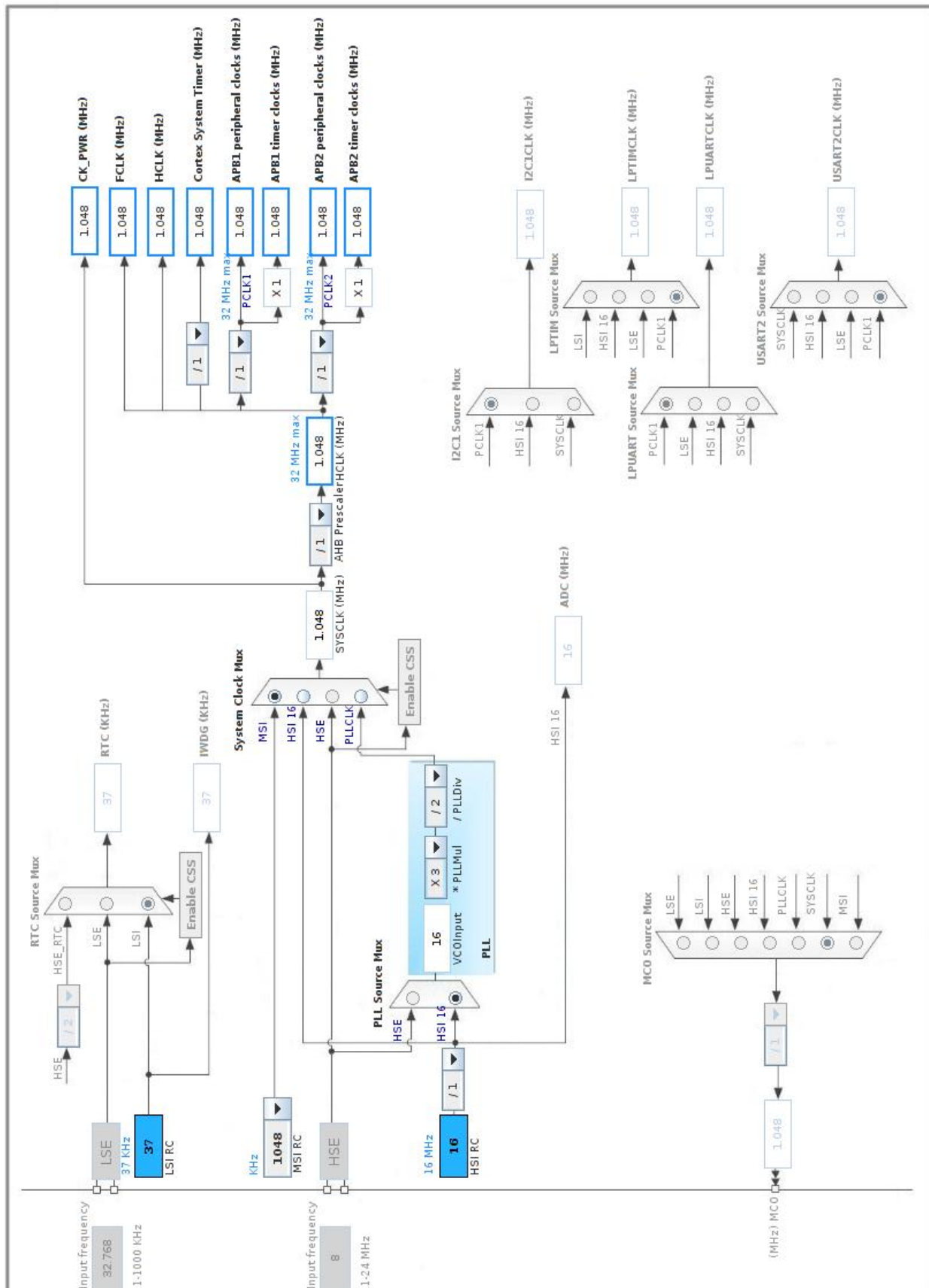
5. IPs and Middleware Configuration

5.1. SYS
mode: Debug Serial Wire
Timebase Source: SysTick

5.2. TIM2
Channel1: PWM Generation CH1
Channel2: PWM Generation CH2

5.2.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**1 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**255 ***
Internal Clock Division (CKD)	No Division

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)	**64 ***
Fast Mode	Disable
CH Polarity	High

PWM Generation Channel 2:

Mode	PWM mode 1
Pulse (16 bits value)	**64 ***
Fast Mode	Disable
CH Polarity	High

5.3. TIM21
Channel1: PWM Generation CH1
Channel2: PWM Generation CH2

5.3.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**1 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**255 ***
Internal Clock Division (CKD)	No Division

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)	**64 ***
Fast Mode	Disable
CH Polarity	High

PWM Generation Channel 2:

Mode	PWM mode 1
Pulse (16 bits value)	**64 ***
Fast Mode	Disable
CH Polarity	High

5.4. TIM22

Channel1: PWM Generation CH1
Channel2: PWM Generation CH2

5.4.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**1 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**255 ***
Internal Clock Division (CKD)	No Division

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)	**64 ***
Fast Mode	Disable
CH Polarity	High

PWM Generation Channel 2:

Mode	PWM mode 1
Pulse (16 bits value)	**64 ***
Fast Mode	Disable
CH Polarity	High

5.5. FREERTOS

mode: Enabled

5.5.1. Config parameters:

Versions:

FreeRTOS version	9.0.0
CMSIS-RTOS version	1.02

Kernel settings:

USE_PREEMPTION	Enabled
CPU_CLOCK_HZ	SystemCoreClock
TICK_RATE_HZ	1000
MAX_PRIORITIES	7
MINIMAL_STACK_SIZE	128
MAX_TASK_NAME_LEN	16
USE_16_BIT_TICKS	Disabled
IDLE_SHOULD_YIELD	Enabled
USE_MUTEXES	Enabled
USE_RECURSIVE_MUTEXES	Disabled
USE_COUNTING_SEMAPHORES	Disabled
QUEUE_REGISTRY_SIZE	8
USE_APPLICATION_TASK_TAG	Disabled
ENABLE_BACKWARD_COMPATIBILITY	Enabled
USE_PORT_OPTIMISED_TASK_SELECTION	Disabled
USE_TICKLESS_IDLE	Disabled
USE_TASK_NOTIFICATIONS	Enabled

Memory management settings:

Memory Allocation	**Static ***

Hook function related definitions:

USE_IDLE_HOOK	Disabled

USE_TICK_HOOK	Disabled
USE_MALLOC_FAILED_HOOK	Disabled
USE_DAEMON_TASK_STARTUP_HOOK	Disabled
CHECK_FOR_STACK_OVERFLOW	Disabled

Run time and task stats gathering related definitions:

GENERATE_RUN_TIME_STATS	Disabled
USE_TRACE_FACILITY	Disabled
USE_STATS_FORMATTING_FUNCTIONS	Disabled

Co-routine related definitions:

USE_CO_ROUTINES	Disabled
MAX_CO_ROUTINE_PRIORITIES	2

Software timer definitions:

USE_TIMERS	Disabled

Interrupt nesting behaviour configuration:

LIBRARY_LOWEST_INTERRUPT_PRIORITY	3
LIBRARY_MAX_SYSCALL_INTERRUPT_PRIORITY	3

5.5.2. Include parameters:

Include definitions:

vTaskPrioritySet	Enabled
uxTaskPriorityGet	Enabled
vTaskDelete	Enabled
vTaskCleanUpResources	Disabled
vTaskSuspend	Enabled
vTaskDelayUntil	Disabled
vTaskDelay	Enabled
xTaskGetSchedulerState	Enabled
xTaskResumeFromISR	Enabled
xQueueGetMutexHolder	Disabled
xSemaphoreGetMutexHolder	Disabled
pcTaskGetTaskName	Disabled
uxTaskGetStackHighWaterMark	Disabled
xTaskGetCurrentTaskHandle	Disabled
eTaskGetState	Disabled
xEventGroupSetBitFromISR	Disabled
xTimerPendFunctionCall	Disabled
xTaskAbortDelay	Disabled
xTaskGetHandle	Disabled

* User modified value

6. System Configuration

6.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
SYS	PA13	SYS_SWDIO	n/a	n/a	n/a	
	PA14	SYS_SWCLK	n/a	n/a	n/a	
TIM2	PA1	TIM2_CH2	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA5	TIM2_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	
TIM21	PA2	TIM21_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA3	TIM21_CH2	Alternate Function Push Pull	No pull-up and no pull-down	Low	
TIM22	PA6	TIM22_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA7	TIM22_CH2	Alternate Function Push Pull	No pull-up and no pull-down	Low	
GPIO	PA0-CK_IN	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PA4	GPIO_Input	Input mode	**Pull-up ***	n/a	

6.2. DMA configuration

nothing configured in DMA service

6.3. NVIC configuration

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	3	0
System tick timer	true	3	0
PVD interrupt through EXTI line 16	unused		
Flash and EEPROM global interrupt	unused		
RCC global interrupt	unused		
TIM2 global interrupt	unused		
TIM21 global interrupt	unused		
TIM22 global interrupt	unused		

* User modified value

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32L0
Line	STM32L0x1
MCU	STM32L031F4Px
Datasheet	027063_Rev4

7.2. Parameter Selection

Temperature	25
Vdd	3.0

8. Software Pack Report

9. Software Project

9.1. Project Settings

Name	Value
Project Name	heart
Project Folder	/home/peter/repos/heart/stm32L031F4/heart
Toolchain / IDE	SW4STM32
Firmware Package Name and Version	STM32Cube FW_L0 V1.10.0

9.2. Code Generation Settings

Name	Value
STM32Cube Firmware Library Package	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
Delete previously generated files when not re-generated	Yes
Set all free pins as analog (to optimize the power consumption)	Yes