

## 1. Description

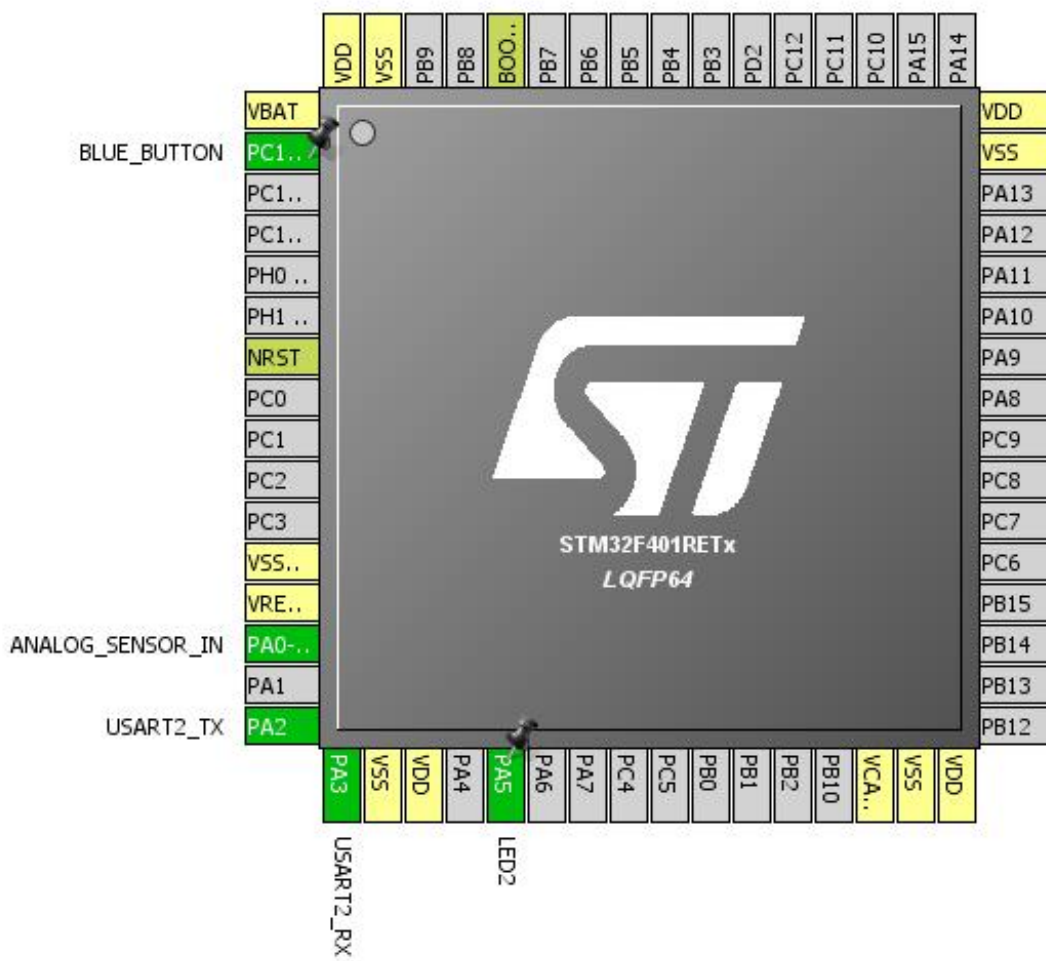
### 1.1. Project

Project Name	TEST_STM32_FreeRTOS
Board Name	TEST_STM32_FreeRTOS
Generated with:	STM32CubeMX 4.20.0
Date	03/23/2017

### 1.2. MCU

MCU Series	STM32F4
MCU Line	STM32F401
MCU name	STM32F401RETx
MCU Package	LQFP64
MCU Pin number	64

## 2. Pinout Configuration

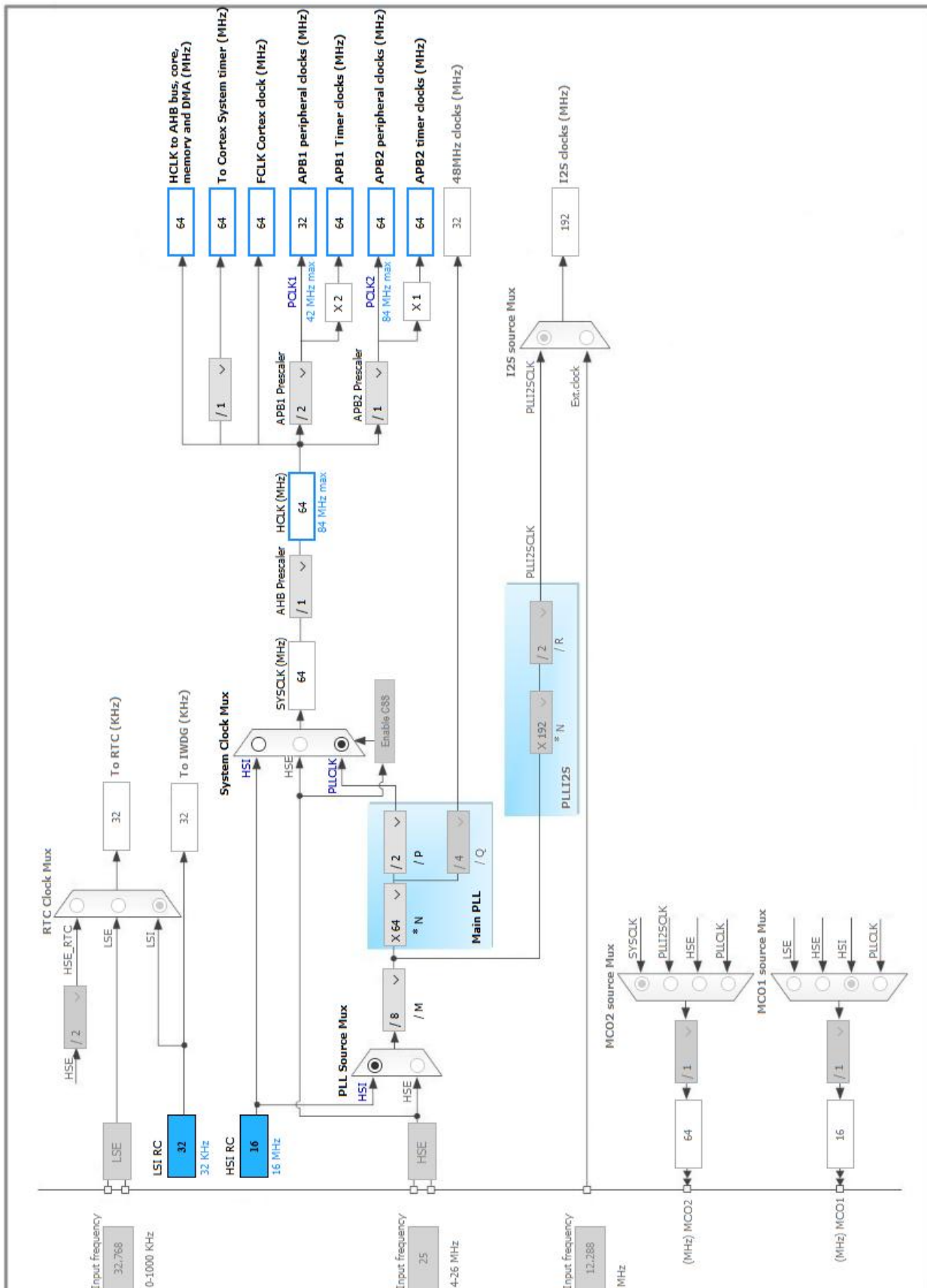


### 3. Pins Configuration

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
2	PC13-ANTI_TAMP	I/O	GPIO_EXTI13	BLUE_BUTTON
7	NRST	Reset		
12	VSSA/VREF-	Power		
13	VREF+	Power		
14	PA0-WKUP	I/O	ADC1_IN0	ANALOG_SENSOR_IN
16	PA2	I/O	USART2_TX	
17	PA3	I/O	USART2_RX	
18	VSS	Power		
19	VDD	Power		
21	PA5 *	I/O	GPIO_Output	LED2
30	VCAP1	Power		
31	VSS	Power		
32	VDD	Power		
47	VSS	Power		
48	VDD	Power		
60	BOOT0	Boot		
63	VSS	Power		
64	VDD	Power		

\* The pin is affected with an I/O function

## 4. Clock Tree Configuration



## 5. IPs and Middleware Configuration

### 5.1. ADC1

mode: IN0

#### 5.1.1. Parameter Settings:

##### ADC\_Settings:

Clock Prescaler	PCLK2 divided by 2
Resolution	12 bits (15 ADC Clock cycles)
Data Alignment	Right alignment
Scan Conversion Mode	<b>Enabled *</b>
Continuous Conversion Mode	<b>Enabled *</b>
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	<b>Enabled *</b>
End Of Conversion Selection	EOC flag at the end of single channel conversion

##### ADC\_Regular\_ConversionMode:

Number Of Conversion	1
External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None
Rank	1
Channel	Channel 0
Sampling Time	3 Cycles

##### ADC\_Injected\_ConversionMode:

Number Of Conversions	0
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##### WatchDog:

Enable Analog WatchDog Mode	false
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### 5.2. TIM2

Clock Source : Internal Clock

#### 5.2.1. Parameter Settings:

##### Counter Settings:

Prescaler (PSC - 16 bits value)	<b>64-1 *</b>
Counter Mode	Up

Counter Period (AutoReload Register - 32 bits value ) **1000-1 \***

Internal Clock Division (CKD) No Division

**Trigger Output (TRGO) Parameters:**

Master/Slave Mode Disable (no sync between this TIM (Master) and its Slaves)

Trigger Event Selection Reset (UG bit from TIMx\_EGR)

## 5.3. USART2

**Mode: Asynchronous**

### 5.3.1. 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

## 5.4. FREERTOS

**mode: Enabled**

### 5.4.1. 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	Dynamic
TOTAL_HEAP_SIZE	15360
Memory Management scheme	heap_4

#### 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:

USE_TRACE_FACILITY	Enabled
GENERATE_RUN_TIME_STATS	Disabled

#### Co-routine related definitions:

USE_CO_ROUTINES	Disabled
MAX_CO_ROUTINE_PRIORITIES	2

#### Software timer definitions:

USE_TIMERS	Disabled
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#### Interrupt nesting behaviour configuration:

LIBRARY_LOWEST_INTERRUPT_PRIORITY	15
LIBRARY_MAX_SYSCALL_INTERRUPT_PRIORITY	5

### 5.4.2. 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
ADC1	PA0-WKUP	ADC1_IN0	Analog mode	No pull-up and no pull-down	n/a	ANALOG_SENSOR_IN
USART2	PA2	USART2_TX	Alternate Function Push Pull	Pull-up	<b>Very High</b> *	
	PA3	USART2_RX	Alternate Function Push Pull	Pull-up	<b>Very High</b> *	
GPIO	PC13-ANTI_TAMP	GPIO_EXTI13	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	BLUE_BUTTON
	PA5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED2

## 6.2. DMA configuration

DMA request	Stream	Direction	Priority
ADC1	DMA2_Stream0	Peripheral To Memory	Low

### ADC1: DMA2\_Stream0 DMA request Settings:

Mode: **Circular \***  
Use fifo: Disable  
Peripheral Increment: Disable  
Memory Increment: **Enable \***  
Peripheral Data Width: **Word \***  
Memory Data Width: **Word \***

### 6.3. 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
Pre-fetch 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	15	0
System tick timer	true	15	0
TIM2 global interrupt	true	6	0
DMA2 stream0 global interrupt	true	5	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
ADC1 global interrupt	unused		
USART2 global interrupt	unused		
EXTI line[15:10] interrupts	unused		
FPU global interrupt	unused		

\* User modified value

## ***7. Power Consumption Calculator report***

### 7.1. Microcontroller Selection

Series	STM32F4
Line	STM32F401
MCU	STM32F401RETx
Datasheet	025644_Rev3

### 7.2. Parameter Selection

Temperature	25
Vdd	null

## 8. Software Project

### 8.1. Project Settings

Name	Value
Project Name	TEST_STM32_FreeRTOS
Project Folder	E:\57010922\Git\TEST_STM32_FreeRTOS
Toolchain / IDE	MDK-ARM V5
Firmware Package Name and Version	STM32Cube FW_F4 V1.15.0

### 8.2. 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	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