

## 1. Description

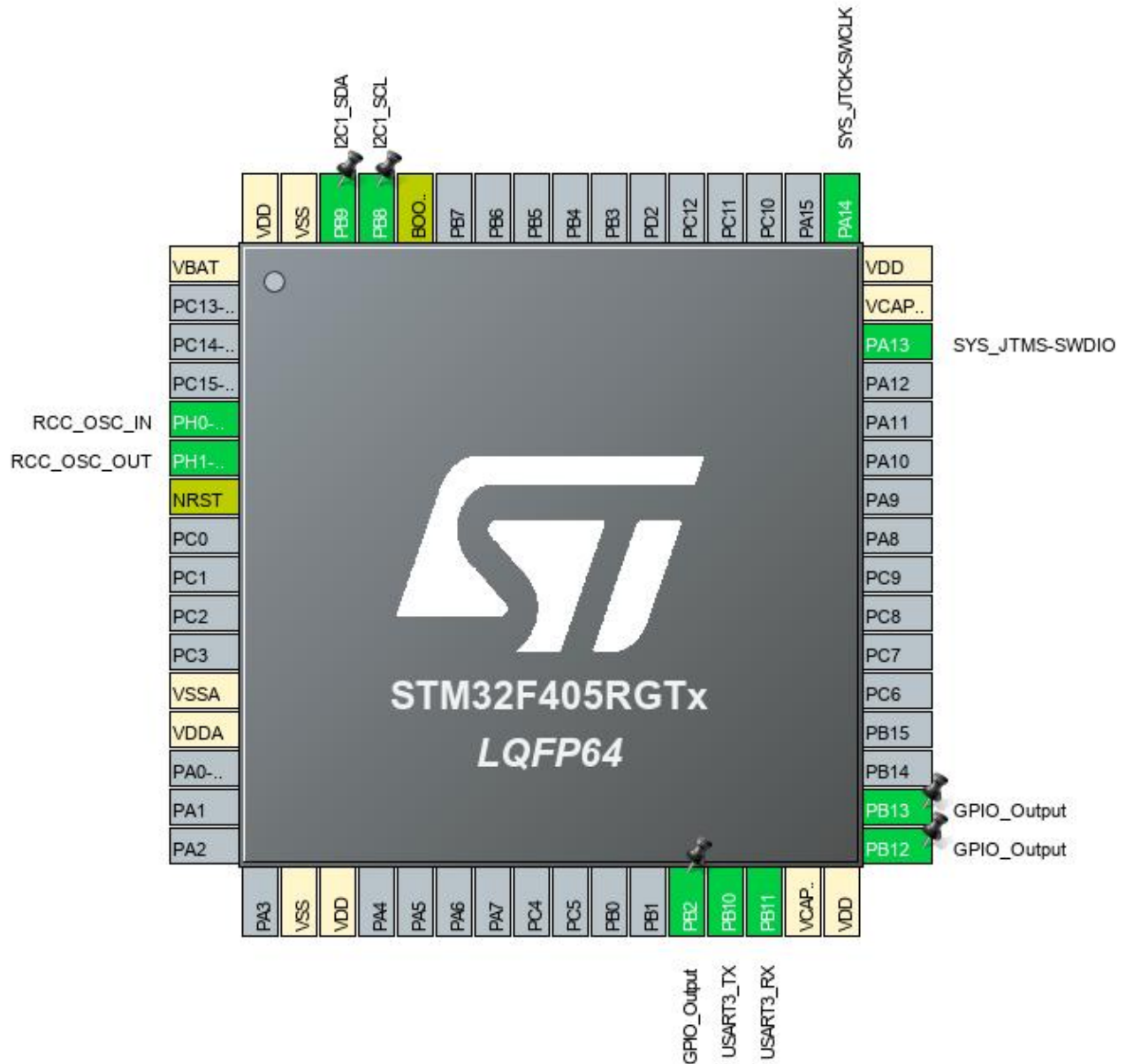
### 1.1. Project

Project Name	RTOS_F4
Board Name	custom
Generated with:	STM32CubeMX 5.4.0
Date	12/03/2019

### 1.2. MCU

MCU Series	STM32F4
MCU Line	STM32F405/415
MCU name	STM32F405RGTx
MCU Package	LQFP64
MCU Pin number	64

## 2. Pinout Configuration

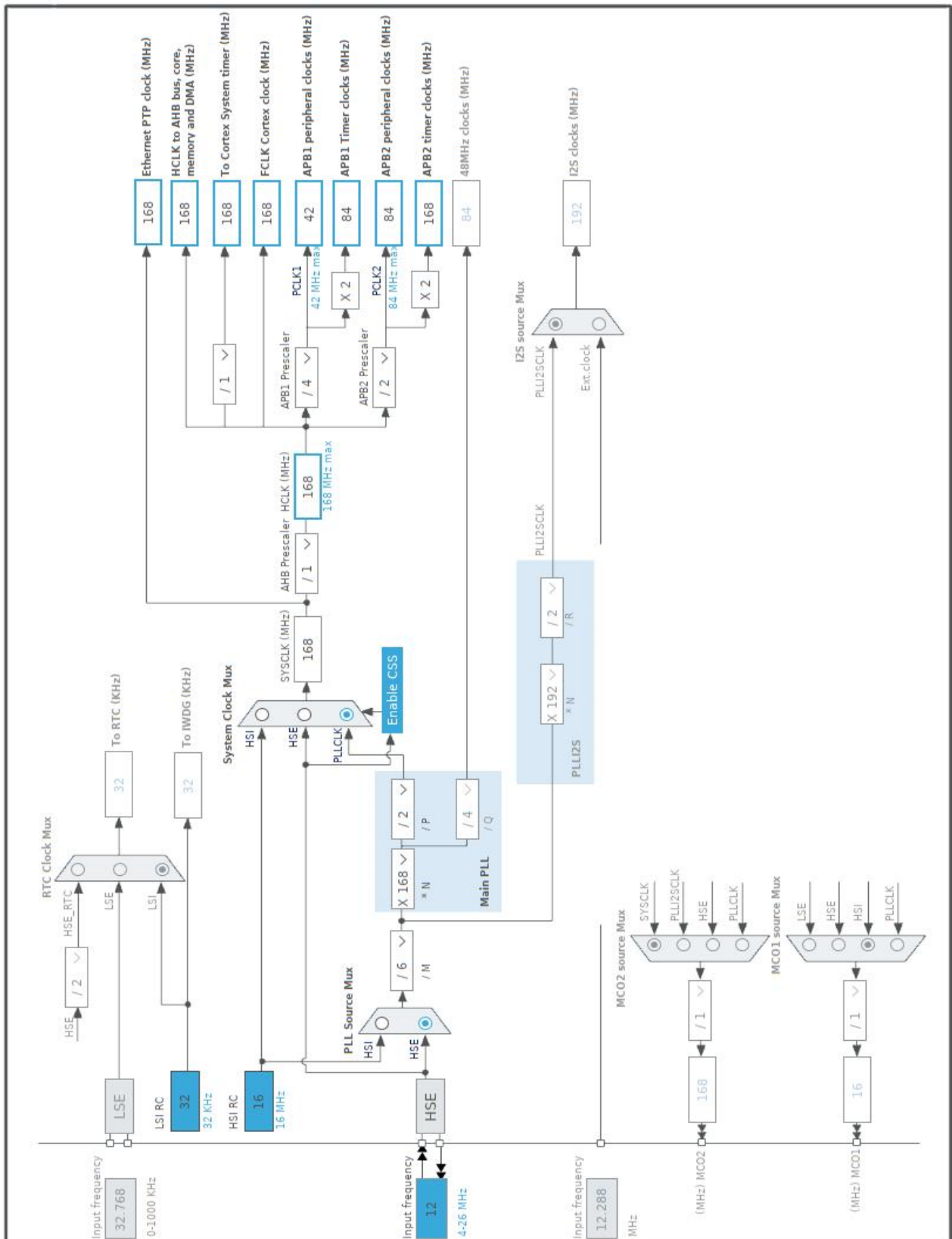


### 3. Pins Configuration

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
5	PH0-OSC_IN	I/O	RCC_OSC_IN	
6	PH1-OSC_OUT	I/O	RCC_OSC_OUT	
7	NRST	Reset		
12	VSSA	Power		
13	VDDA	Power		
18	VSS	Power		
19	VDD	Power		
28	PB2 *	I/O	GPIO_Output	
29	PB10	I/O	USART3_TX	
30	PB11	I/O	USART3_RX	
31	VCAP_1	Power		
32	VDD	Power		
33	PB12 *	I/O	GPIO_Output	
34	PB13 *	I/O	GPIO_Output	
46	PA13	I/O	SYS_JTMS-SWDIO	
47	VCAP_2	Power		
48	VDD	Power		
49	PA14	I/O	SYS_JTCK-SWCLK	
60	BOOT0	Boot		
61	PB8	I/O	I2C1_SCL	
62	PB9	I/O	I2C1_SDA	
63	VSS	Power		
64	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	RTOS_F4
Project Folder	/home/danglamtung/STM32CubeIDE/workspace_1.0.2/RTOS_F4
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_F4 V1.24.1

### 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	STM32F4
Line	STM32F405/415
MCU	STM32F405RGTx
Datasheet	022152_Rev8

### 6.2. Parameter Selection

Temperature	25
Vdd	3.3

## 7. IPs and Middleware Configuration

### 7.1. GPIO

### 7.2. I2C1

#### I2C: I2C

##### 7.2.1. Parameter Settings:

###### Master Features:

I2C Speed Mode	<b>Fast Mode *</b>
I2C Clock Speed (Hz)	400000
Fast Mode Duty Cycle	Duty cycle Tlow/Thigh = 2

###### Slave Features:

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

### 7.3. RCC

#### High Speed Clock (HSE): Crystal/Ceramic Resonator

##### 7.3.1. Parameter Settings:

###### System Parameters:

VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Enabled
Data Cache	Enabled
Flash Latency(WS)	5 WS (6 CPU cycle)

###### RCC Parameters:

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

###### Power Parameters:

Power Regulator Voltage Scale	Power Regulator Voltage Scale 1
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## 7.4. SYS

**Debug: Serial Wire**

**Timebase Source: TIM14**

## 7.5. TIM7

**mode: Activated**

### 7.5.1. Parameter Settings:

#### Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value )	<b>10000 *</b>
auto-reload preload	Disable

#### Trigger Output (TRGO) Parameters:

Trigger Event Selection	Reset (UG bit from TIMx_EGR)
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## 7.6. USART3

**Mode: Asynchronous**

### 7.6.1. 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

## 7.7. FREERTOS

**Interface: CMSIS\_V1**

### 7.7.1. Config parameters:

**API:**



FreeRTOS API CMSIS v1

**Versions:**

FreeRTOS version 10.0.1  
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 Enabled  
USE\_TICKLESS\_IDLE Disabled  
USE\_TASK\_NOTIFICATIONS Enabled  
RECORD\_STACK\_HIGH\_ADDRESS Disabled

**Memory management settings:**

Memory Allocation Dynamic / Static  
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:**

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 15  
LIBRARY\_MAX\_SYSCALL\_INTERRUPT\_PRIORITY 5

### 7.7.2. 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

## 8. System Configuration

### 8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
I2C1	PB8	I2C1_SCL	Alternate Function Open Drain	Pull-up	<b>Very High</b> *	
	PB9	I2C1_SDA	Alternate Function Open Drain	Pull-up	<b>Very High</b> *	
RCC	PH0-OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	
	PH1-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	
USART3	PB10	USART3_TX	Alternate Function Push Pull	Pull-up	<b>Very High</b> *	
	PB11	USART3_RX	Alternate Function Push Pull	Pull-up	<b>Very High</b> *	
GPIO	PB2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PB12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PB13	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	

### 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
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
TIM8 trigger and commutation interrupts and TIM14 global interrupt	true	0	0
TIM7 global interrupt	true	5	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
I2C1 event interrupt	unused		
I2C1 error interrupt	unused		
USART3 global interrupt	unused		
FPU global interrupt	unused		

\* User modified value

## ***9. Software Pack Report***