

## 1. Description

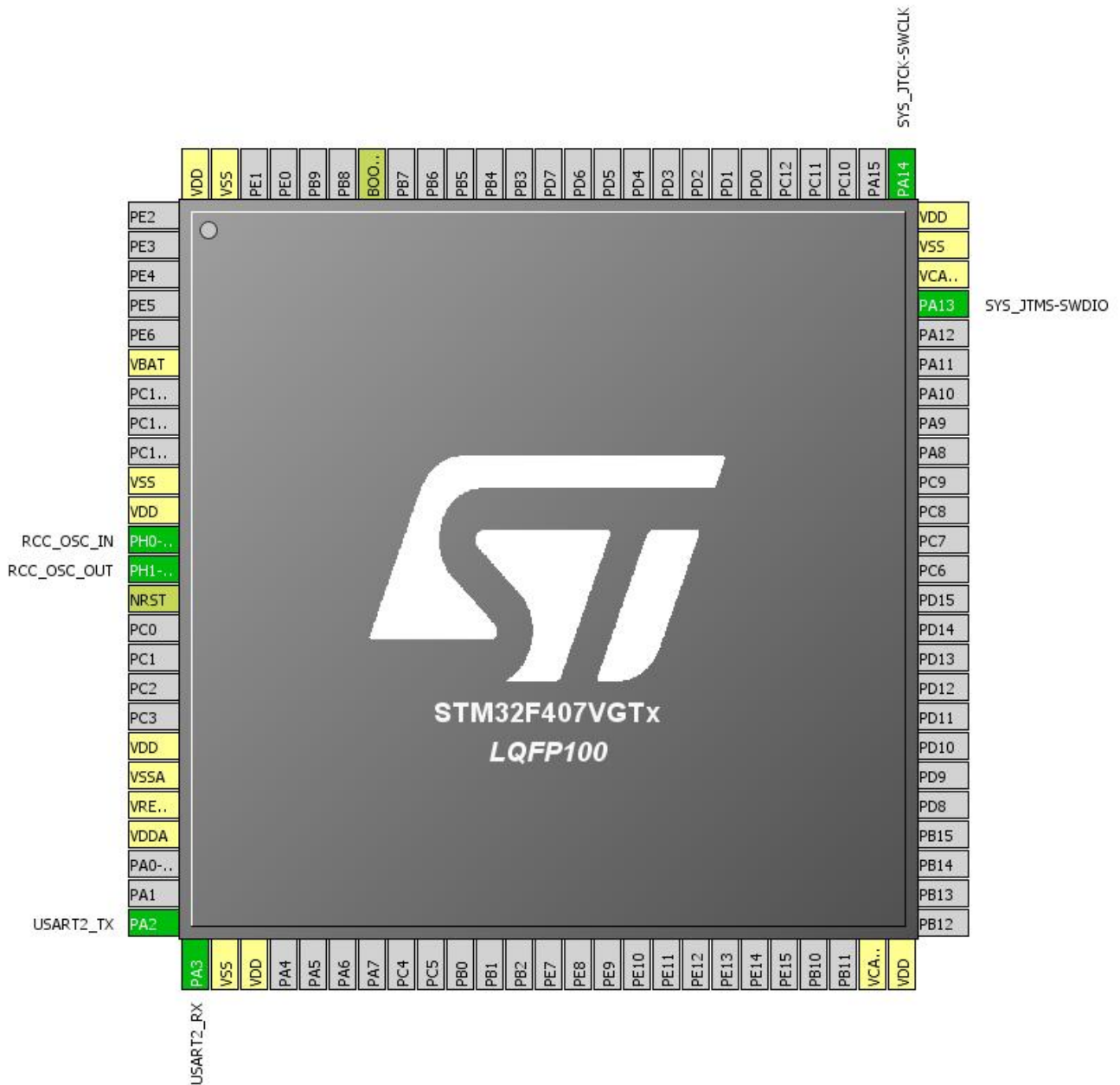
### 1.1. Project

|                 |                        |
|-----------------|------------------------|
| Project Name    | STM32F4DISC_FR_AWS_OTA |
| Board Name      | custom                 |
| Generated with: | STM32CubeMX 4.27.0     |
| Date            | 03/13/2019             |

### 1.2. MCU

|                |               |
|----------------|---------------|
| MCU Series     | STM32F4       |
| MCU Line       | STM32F407/417 |
| MCU name       | STM32F407VGTx |
| MCU Package    | LQFP100       |
| MCU Pin number | 100           |

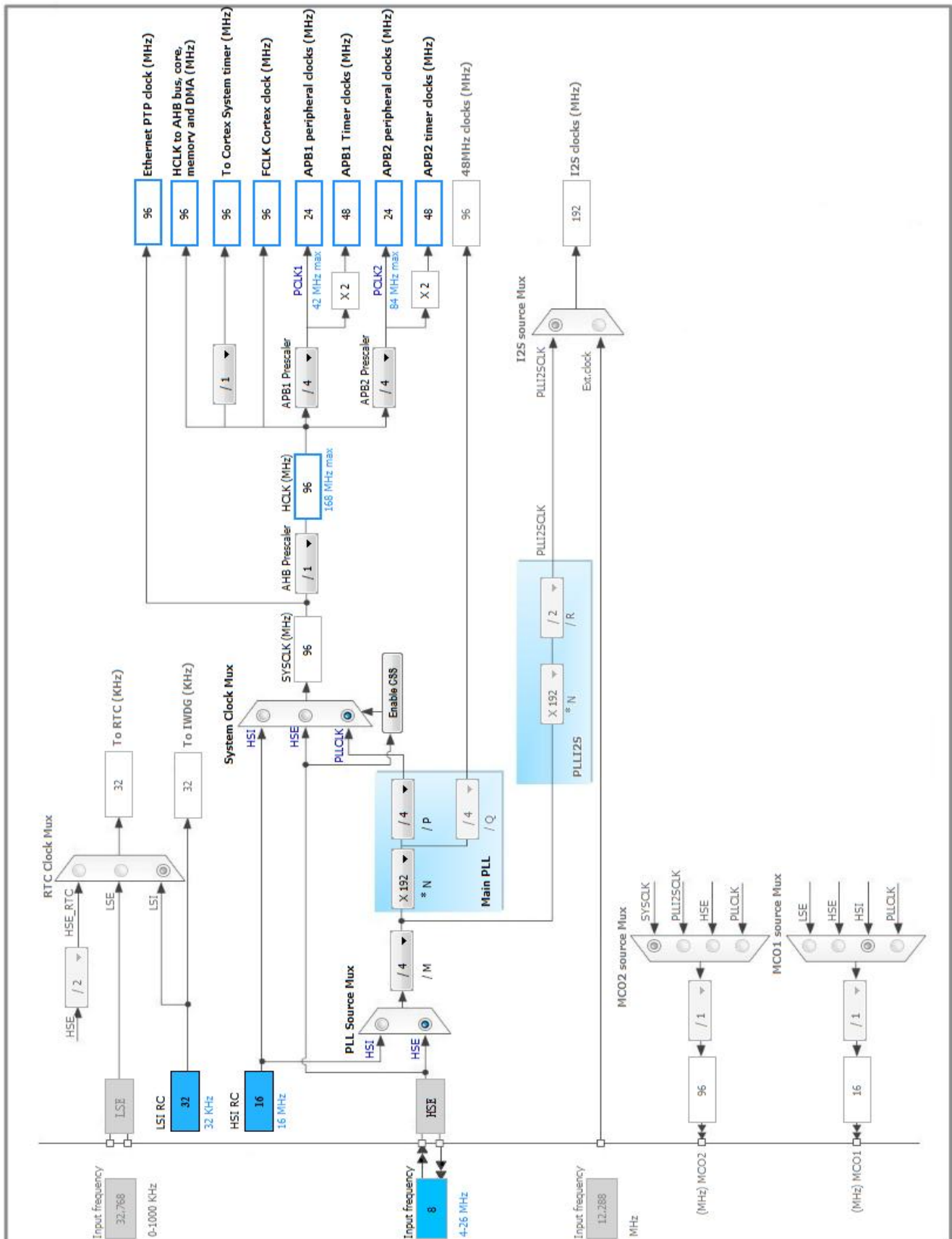
## 2. Pinout Configuration



### 3. Pins Configuration

| Pin Number<br>LQFP100 | Pin Name<br>(function after<br>reset) | Pin Type | Alternate<br>Function(s) | Label |
|-----------------------|---------------------------------------|----------|--------------------------|-------|
| 6                     | VBAT                                  | Power    |                          |       |
| 10                    | VSS                                   | Power    |                          |       |
| 11                    | VDD                                   | Power    |                          |       |
| 12                    | PH0-OSC_IN                            | I/O      | RCC_OSC_IN               |       |
| 13                    | PH1-OSC_OUT                           | I/O      | RCC_OSC_OUT              |       |
| 14                    | NRST                                  | Reset    |                          |       |
| 19                    | VDD                                   | Power    |                          |       |
| 20                    | VSSA                                  | Power    |                          |       |
| 21                    | VREF+                                 | Power    |                          |       |
| 22                    | VDDA                                  | Power    |                          |       |
| 25                    | PA2                                   | I/O      | USART2_TX                |       |
| 26                    | PA3                                   | I/O      | USART2_RX                |       |
| 27                    | VSS                                   | Power    |                          |       |
| 28                    | VDD                                   | Power    |                          |       |
| 49                    | VCAP_1                                | Power    |                          |       |
| 50                    | VDD                                   | Power    |                          |       |
| 72                    | PA13                                  | I/O      | SYS_JTMS-SWDIO           |       |
| 73                    | VCAP_2                                | Power    |                          |       |
| 74                    | VSS                                   | Power    |                          |       |
| 75                    | VDD                                   | Power    |                          |       |
| 76                    | PA14                                  | I/O      | SYS_JTCK-SWCLK           |       |
| 94                    | BOOT0                                 | Boot     |                          |       |
| 99                    | VSS                                   | Power    |                          |       |
| 100                   | VDD                                   | Power    |                          |       |

## 4. Clock Tree Configuration



## 5. IPs and Middleware Configuration

### 5.1. RCC

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

##### 5.1.1. Parameter Settings:

###### System Parameters:

|                   |                    |
|-------------------|--------------------|
| VDD voltage (V)   | 3.3                |
| Instruction Cache | Enabled            |
| Prefetch Buffer   | Enabled            |
| Data Cache        | Enabled            |
| Flash Latency(WS) | 3 WS (4 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 |
|-------------------------------|---------------------------------|

### 5.2. SYS

#### Debug: Serial Wire

#### Timebase Source: TIM2

### 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 | Enabled         |
| 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:

|                                |          |
|--------------------------------|----------|
| 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  |

### 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 |
|--------|-------------|----------------|------------------------------|------------------------|-----------------------|------------|
| 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                   |            |
| USART2 | PA2         | USART2_TX      | Alternate Function Push Pull | Pull-up                | <b>Very High</b><br>* |            |
|        | PA3         | USART2_RX      | Alternate Function Push Pull | Pull-up                | <b>Very High</b><br>* |            |

### 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           |
| 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   | 0                    | 0           |
| PVD interrupt through EXTI line 16      | unused |                      |             |
| Flash global interrupt                  | unused |                      |             |
| RCC global interrupt                    | unused |                      |             |
| USART2 global interrupt                 | unused |                      |             |
| FPU global interrupt                    | unused |                      |             |

\* User modified value

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

### 7.1. Microcontroller Selection

|           |               |
|-----------|---------------|
| Series    | STM32F4       |
| Line      | STM32F407/417 |
| MCU       | STM32F407VGTx |
| Datasheet | 022152_Rev8   |

### 7.2. Parameter Selection

|             |     |
|-------------|-----|
| Temperature | 25  |
| Vdd         | 3.3 |

## 8. Software Project

### 8.1. Project Settings

| Name                              | Value   |
|-----------------------------------|---|
| Project Name                      | STM32F4DISC_FR_AWS_OTA                                |
| Project Folder                    | C:\Users\Administrator\Desktop\STM32F4DISC_FR_AWS_OTA |
| Toolchain / IDE                   | MDK-ARM V5  |
| Firmware Package Name and Version | STM32Cube FW_F4 V1.21.0                               |

### 8.2. Code Generation Settings

| Name  | Value   |
|---|---|
| STM32Cube Firmware Library Package                              | Copy all used libraries into the project folder |
| Generate peripheral initialization as a pair of '.c/.h' files   | Yes   |
| Backup previously generated files when re-generating            | Yes   |
| Delete previously generated files when not re-generated         | No  |
| Set all free pins as analog (to optimize the power consumption) | No  |

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