



## 1. Description

### 1.1. Project

|                 |                     |
|-----------------|---------------------|
| Project Name    | F767ZIV1_EventFlags |
| Board Name      | NUCLEO-F767ZI       |
| Generated with: | STM32CubeMX 6.1.1   |
| Date            | 10/10/2021          |

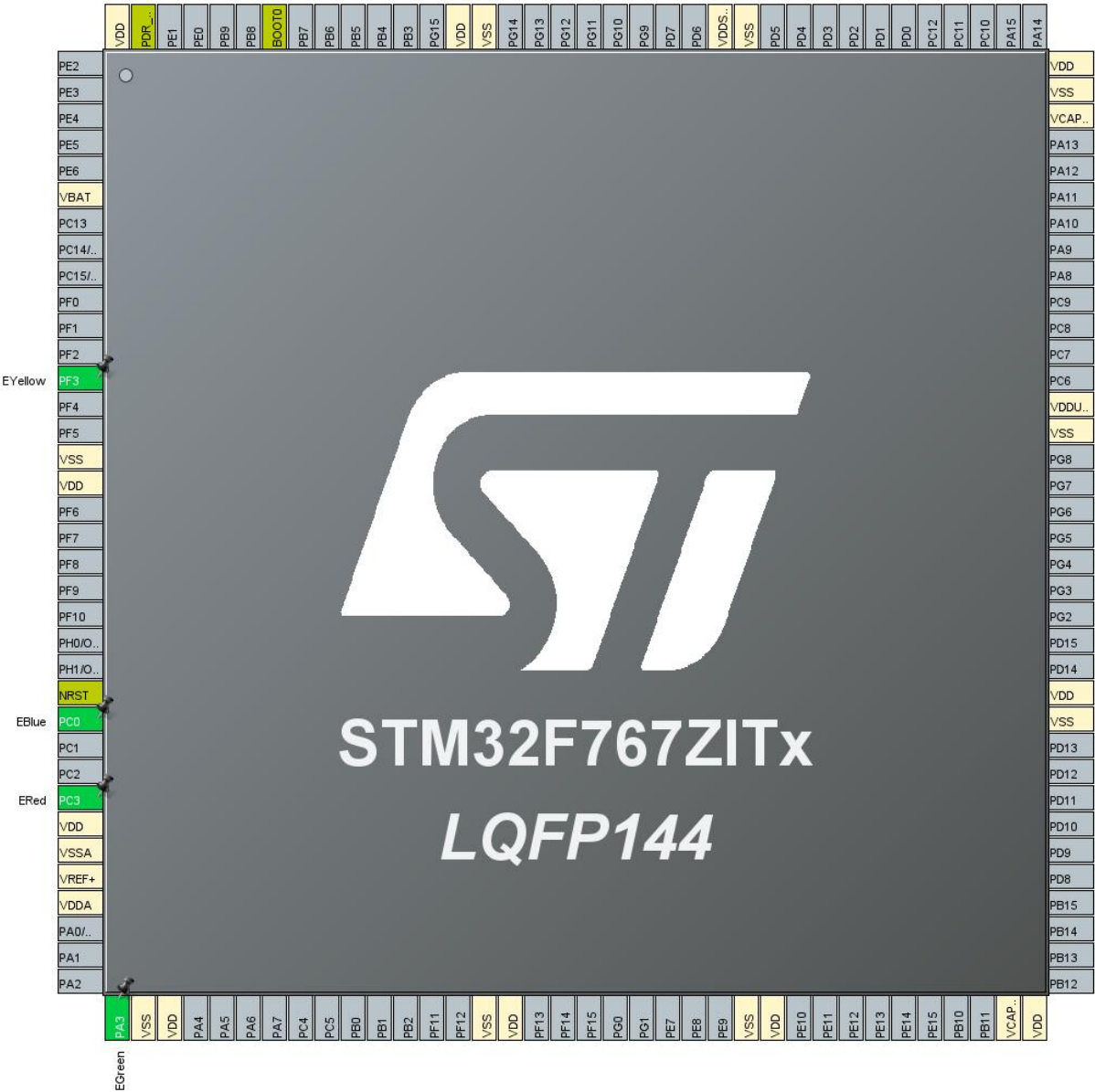
### 1.2. MCU

|                |               |
|----------------|---------------|
| MCU Series     | STM32F7       |
| MCU Line       | STM32F7x7     |
| MCU name       | STM32F767ZITx |
| MCU Package    | LQFP144       |
| MCU Pin number | 144           |

### 1.3. Core(s) information

|         |               |
|---------|---------------|
| Core(s) | Arm Cortex-M7 |
|---------|---------------|

## 2. Pinout Configuration

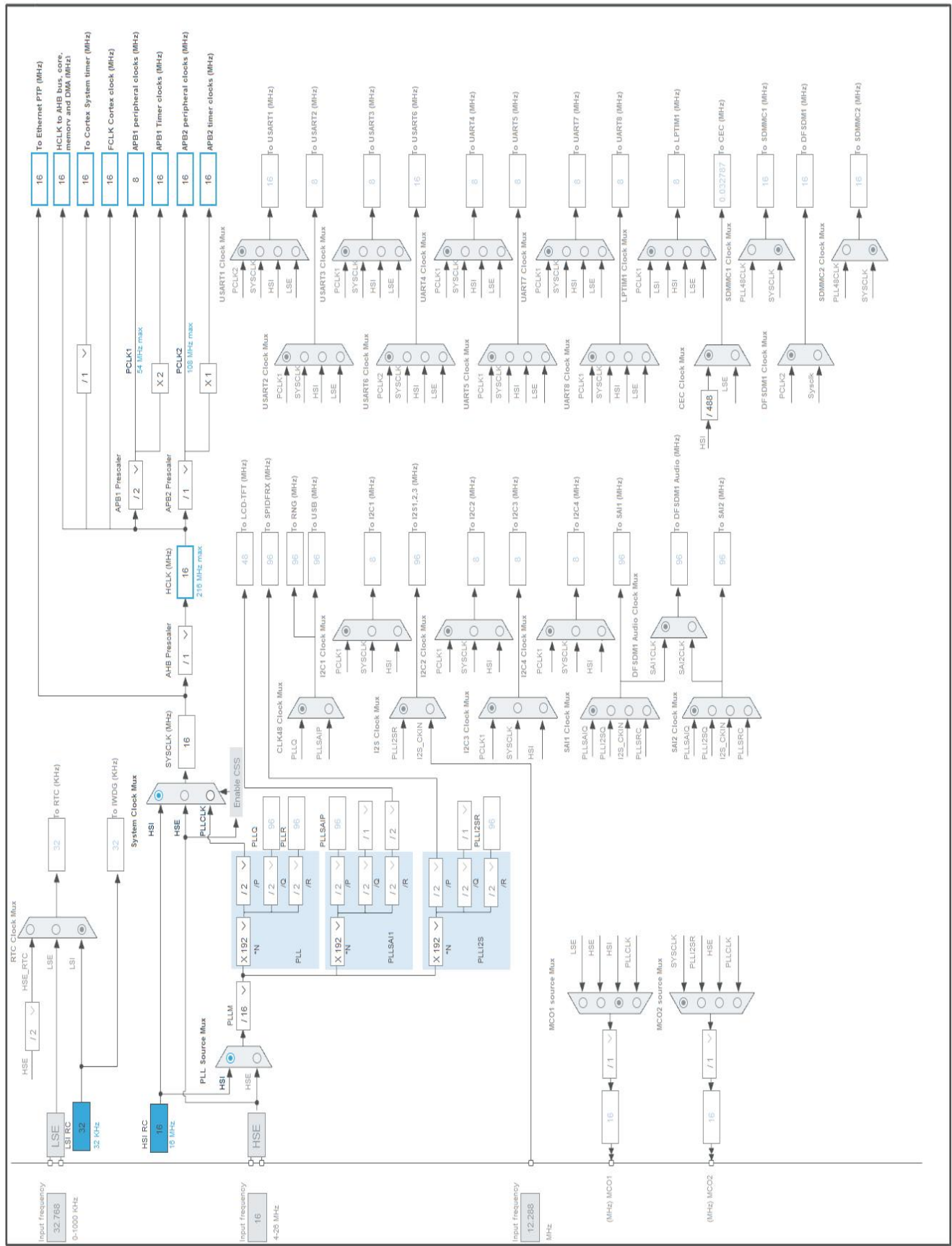


### 3. Pins Configuration

| Pin Number<br>LQFP144 | Pin Name<br>(function after<br>reset) | Pin Type | Alternate<br>Function(s) | Label   |
|-----------------------|---------------------------------------|----------|--------------------------|---------|
| 6                     | VBAT                                  | Power    |                          |         |
| 13                    | PF3 *                                 | I/O      | GPIO_Output              | EYellow |
| 16                    | VSS                                   | Power    |                          |         |
| 17                    | VDD                                   | Power    |                          |         |
| 25                    | NRST                                  | Reset    |                          |         |
| 26                    | PC0 *                                 | I/O      | GPIO_Output              | EBlue   |
| 29                    | PC3 *                                 | I/O      | GPIO_Output              | ERed    |
| 30                    | VDD                                   | Power    |                          |         |
| 31                    | VSSA                                  | Power    |                          |         |
| 32                    | VREF+                                 | Power    |                          |         |
| 33                    | VDDA                                  | Power    |                          |         |
| 37                    | PA3 *                                 | I/O      | GPIO_Output              | EGreen  |
| 38                    | VSS                                   | Power    |                          |         |
| 39                    | VDD                                   | Power    |                          |         |
| 51                    | VSS                                   | Power    |                          |         |
| 52                    | VDD                                   | Power    |                          |         |
| 61                    | VSS                                   | Power    |                          |         |
| 62                    | VDD                                   | Power    |                          |         |
| 71                    | VCAP_1                                | Power    |                          |         |
| 72                    | VDD                                   | Power    |                          |         |
| 83                    | VSS                                   | Power    |                          |         |
| 84                    | VDD                                   | Power    |                          |         |
| 94                    | VSS                                   | Power    |                          |         |
| 95                    | VDDUSB                                | Power    |                          |         |
| 106                   | VCAP_2                                | Power    |                          |         |
| 107                   | VSS                                   | Power    |                          |         |
| 108                   | VDD                                   | Power    |                          |         |
| 120                   | VSS                                   | Power    |                          |         |
| 121                   | VDDSDMMC                              | Power    |                          |         |
| 130                   | VSS                                   | Power    |                          |         |
| 131                   | VDD                                   | Power    |                          |         |
| 138                   | BOOT0                                 | Boot     |                          |         |
| 143                   | PDR_ON                                | Reset    |                          |         |
| 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                      | F767ZIV1_EventFlags                               |
| Project Folder                    | E:\Mysrc\EmbeddedSystems\RTOS\F767ZIV1_EventFlags |
| Toolchain / IDE                   | STM32CubeIDE                                      |
| Firmware Package Name and Version | STM32Cube FW_F7 V1.16.0                           |
| Application Structure             | Advanced  |
| Generate Under Root               | Yes   |
| Do not generate the main()        | No  |
| Minimum Heap Size                 | 0x200   |
| Minimum Stack Size                | 0x400   |

### 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                                    |
| Keep User Code when re-generating                               | Yes                                   |
| Delete previously generated files when not re-generated         | Yes                                   |
| Set all free pins as analog (to optimize the power consumption) | No                                    |
| Enable Full Assert  | No                                    |

### 5.3. Advanced Settings - Generated Function Calls

| Rank | Function Name      | Peripheral Instance Name |
|------|--------------------|--------------------------|
| 1    | MX_GPIO_Init       | GPIO                     |
| 2    | SystemClock_Config | RCC                      |

## 6. Power Consumption Calculator report

### 6.1. Microcontroller Selection

|           |               |
|-----------|---------------|
| Series    | STM32F7       |
| Line      | STM32F7x7     |
| MCU       | STM32F767ZITx |
| Datasheet | DS11532_Rev4  |

### 6.2. Parameter Selection

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

### 6.3. Battery Selection

|                   |              |
|-------------------|--------------|
| Battery           | Alkaline(9V) |
| Capacity          | 625.0 mAh    |
| Self Discharge    | 0.3 %/month  |
| Nominal Voltage   | 9.0 V        |
| Max Cont Current  | 200.0 mA     |
| Max Pulse Current | 0.0 mA       |
| Cells in series   | 1            |
| Cells in parallel | 1            |



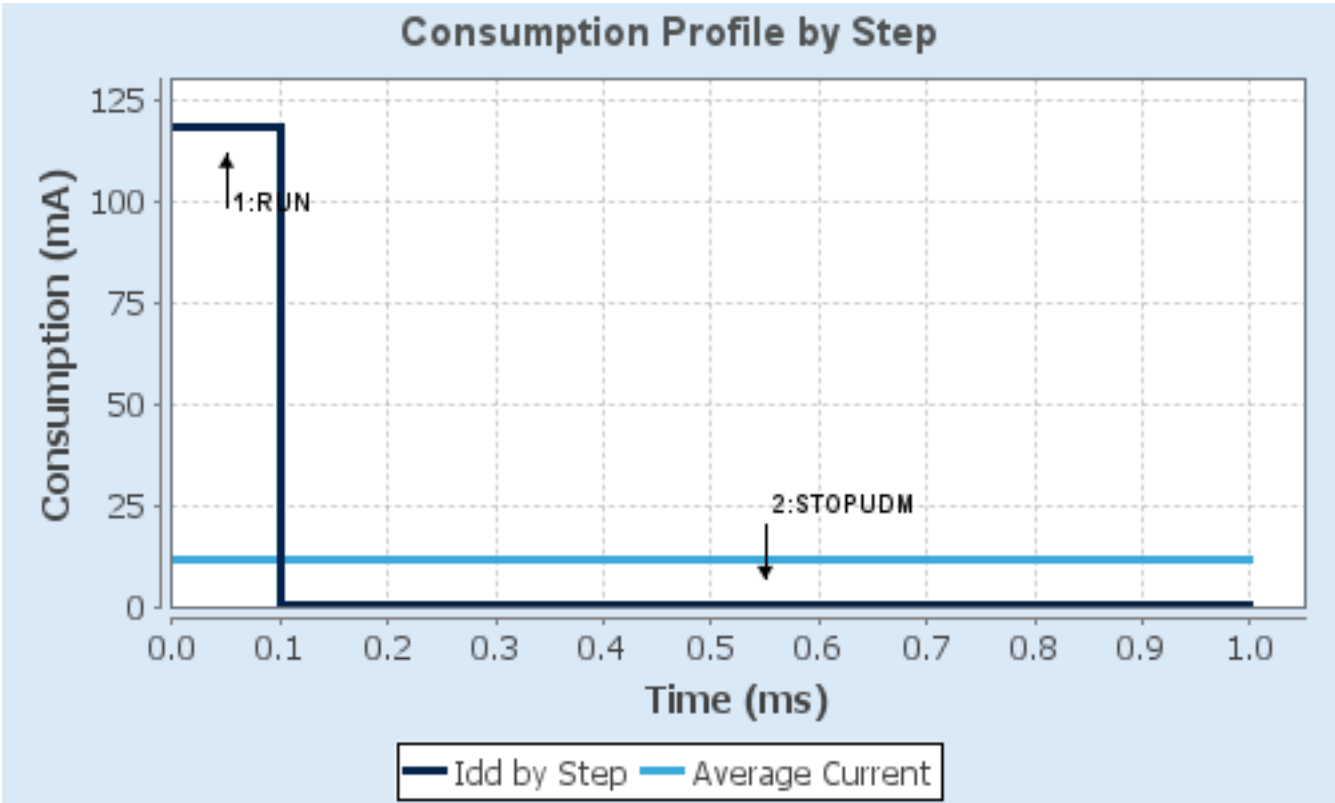
#### 6.4. Sequence

|                               |                                |                           |
|-------------------------------|--------------------------------|---------------------------|
| <b>Step</b>                   | Step1                          | Step2                     |
| <b>Mode</b>                   | RUN                            | STOP UDM (Under Drive)    |
| <b>Vdd</b>                    | 3.3                            | 3.3                       |
| <b>Voltage Source</b>         | Battery                        | Battery                   |
| <b>Range</b>                  | Scale1-High                    | No Scale                  |
| <b>Fetch Type</b>             | ICTM FLASH-SingleBank<br>REGON | n/a                       |
| <b>CPU Frequency</b>          | 216 MHz                        | 0 Hz                      |
| <b>Clock Configuration</b>    | HSE PLL                        | Regulator LP Flash-PwrDwn |
| <b>Clock Source Frequency</b> | 4 MHz                          | 0 Hz                      |
| <b>Peripherals</b>            |                                |                           |
| <b>Additional Cons.</b>       | 0 mA                           | 0 mA                      |
| <b>Average Current</b>        | 118 mA                         | 130 $\mu$ A               |
| <b>Duration</b>               | 0.1 ms                         | 0.9 ms                    |
| <b>DMIPS</b>                  | 462.0                          | 0.0                       |
| <b>Ta Max</b>                 | 89.42                          | 104.98                    |
| <b>Category</b>               | In DS Table                    | In DS Table               |

#### 6.5. Results

|               |                 |                 |                    |
|---------------|-----------------|-----------------|--------------------|
| Sequence Time | 1 ms            | Average Current | 11.92 mA           |
| Battery Life  | 2 days, 4 hours | Average DMIPS   | 462.24005<br>DMIPS |

#### 6.6. Chart



## 7. Peripherals and Middlewares Configuration

### 7.1. RCC

#### 7.1.1. Parameter Settings:

##### System Parameters:

|                   |                    |
|-------------------|--------------------|
| VDD voltage (V)   | 3.3                |
| Flash Latency(WS) | 0 WS (1 CPU cycle) |

##### RCC Parameters:

|                                |          |
|--------------------------------|----------|
| HSI Calibration Value          | 16       |
| TIM Prescaler Selection        | Disabled |
| HSE Startup Timeout Value (ms) | 100      |
| LSE Startup Timeout Value (ms) | 5000     |

##### Power Parameters:

|                               |                                 |
|-------------------------------|---------------------------------|
| Power Over Drive              | Disabled                        |
| Power Regulator Voltage Scale | Power Regulator Voltage Scale 3 |

### 7.2. SYS

Timebase Source: TIM1

### 7.3. FREERTOS

#### Interface: CMSIS\_V1

#### 7.3.1. Config parameters:

##### API:

|              |          |
|--------------|----------|
| FreeRTOS API | CMSIS v1 |
|--------------|----------|

##### Versions:

|                    |        |
|--------------------|--------|
| FreeRTOS version   | 10.2.1 |
| CMSIS-RTOS version | 1.02   |

##### MPU/FPU:

|            |          |
|------------|----------|
| ENABLE_MPU | Disabled |
| ENABLE_FPU | Disabled |

##### 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  |

#### Added with 10.2.1 support:

|                            |          |
|----------------------------|----------|
| MESSAGE_BUFFER_LENGTH_TYPE | size_t   |
| USE_POSIX_ERRNO            | Disabled |

### 7.3.2. 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 |
| uxTaskGetStackHighWaterMark2 | Disabled |

**7.3.3. Advanced settings:**

**Newlib settings (see parameter description first):**

|                      |          |
|----------------------|----------|
| USE_NEWLIB_REENTRANT | Disabled |
|----------------------|----------|

**Project settings (see parameter description first):**

|                       |         |
|-----------------------|---------|
| Use FW pack heap file | Enabled |
|-----------------------|---------|

**\* User modified value**

## 8. System Configuration

### 8.1. GPIO configuration

| IP   | Pin | Signal      | GPIO mode        | GPIO pull/up pull down      | Max Speed | User Label |
|------|-----|-------------|------------------|-----------------------------|-----------|------------|
| GPIO | PF3 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low       | EYellow    |
|      | PC0 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low       | EBlue      |
|      | PC3 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low       | ERed       |
|      | PA3 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low       | EGreen     |

### 8.2. DMA configuration

nothing configured in DMA service

### 8.3. NVIC configuration

#### 8.3.1. NVIC

| 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           |
| TIM1 update interrupt and TIM10 global interrupt | true   | 0                    | 0           |
| PVD interrupt through EXTI line 16               | unused |                      |             |
| Flash global interrupt                           | unused |                      |             |
| RCC global interrupt                             | unused |                      |             |
| FPU global interrupt                             | unused |                      |             |

#### 8.3.2. NVIC Code generation

| Enabled interrupt Table                          | Select for init sequence ordering | Generate IRQ handler | Call HAL handler |
|--|-----------------------------------|----------------------|------------------|
| Non maskable interrupt                           | false                             | true                 | false            |
| Hard fault interrupt                             | false                             | true                 | false            |
| Memory management fault                          | false                             | true                 | false            |
| Pre-fetch fault, memory access fault             | false                             | true                 | false            |
| Undefined instruction or illegal state           | false                             | true                 | false            |
| System service call via SWI instruction          | false                             | false                | false            |
| Debug monitor                                    | false                             | true                 | false            |
| Pendable request for system service              | false                             | false                | false            |
| System tick timer                                | false                             | false                | true             |
| TIM1 update interrupt and TIM10 global interrupt | false                             | true                 | true             |

\* User modified value

## 9. System Views

### 9.1. Category view

#### 9.1.1. Current

| Middleware  |        |        |              |            |          |           |
|-------------|--------|--------|--------------|------------|----------|-----------|
| FREERTOS    |        |        |              |            |          |           |
| System Core | Analog | Timers | Connectivity | Multimedia | Security | Computing |
| CORTEX_M7   |        |        |              |            |          |           |
| DMA         |        |        |              |            |          |           |
| GPIO        |        |        |              |            |          |           |
| IVIC        |        |        |              |            |          |           |
| RCC         |        |        |              |            |          |           |
| SYS         |        |        |              |            |          |           |



## 10. Docs & Resources

| Type               | Link  |
|--------------------|---|
| Datasheet          | <a href="http://www.st.com/resource/en/datasheet/DM00273119.pdf">http://www.st.com/resource/en/datasheet/DM00273119.pdf</a>                   |
| Reference manual   | <a href="http://www.st.com/resource/en/reference_manual/DM00224583.pdf">http://www.st.com/resource/en/reference_manual/DM00224583.pdf</a>     |
| Programming manual | <a href="http://www.st.com/resource/en/programming_manual/DM00237416.pdf">http://www.st.com/resource/en/programming_manual/DM00237416.pdf</a> |
| Errata sheet       | <a href="http://www.st.com/resource/en/errata_sheet/DM00257543.pdf">http://www.st.com/resource/en/errata_sheet/DM00257543.pdf</a>             |
| Application note   | <a href="http://www.st.com/resource/en/application_note/CD00167594.pdf">http://www.st.com/resource/en/application_note/CD00167594.pdf</a>     |
| Application note   | <a href="http://www.st.com/resource/en/application_note/CD00211314.pdf">http://www.st.com/resource/en/application_note/CD00211314.pdf</a>     |
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| Application note   | <a href="http://www.st.com/resource/en/application_note/CD00264321.pdf">http://www.st.com/resource/en/application_note/CD00264321.pdf</a>     |
| Application note   | <a href="http://www.st.com/resource/en/application_note/CD00264342.pdf">http://www.st.com/resource/en/application_note/CD00264342.pdf</a>     |
| Application note   | <a href="http://www.st.com/resource/en/application_note/CD00264379.pdf">http://www.st.com/resource/en/application_note/CD00264379.pdf</a>     |
| Application note   | <a href="http://www.st.com/resource/en/application_note/DM00042534.pdf">http://www.st.com/resource/en/application_note/DM00042534.pdf</a>     |
| Application note   | <a href="http://www.st.com/resource/en/application_note/DM00046011.pdf">http://www.st.com/resource/en/application_note/DM00046011.pdf</a>     |
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| Application note   | <a href="http://www.st.com/resource/en/application_note/DM00080497.pdf">http://www.st.com/resource/en/application_note/DM00080497.pdf</a>     |
| Application note   | <a href="http://www.st.com/resource/en/application_note/DM00081379.pdf">http://www.st.com/resource/en/application_note/DM00081379.pdf</a>     |
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Application note [http://www.st.com/resource/en/application\\_note/DM00226326.pdf](http://www.st.com/resource/en/application_note/DM00226326.pdf)  
Application note [http://www.st.com/resource/en/application\\_note/DM00236305.pdf](http://www.st.com/resource/en/application_note/DM00236305.pdf)  
Application note [http://www.st.com/resource/en/application\\_note/DM00281138.pdf](http://www.st.com/resource/en/application_note/DM00281138.pdf)  
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