# 1. Description

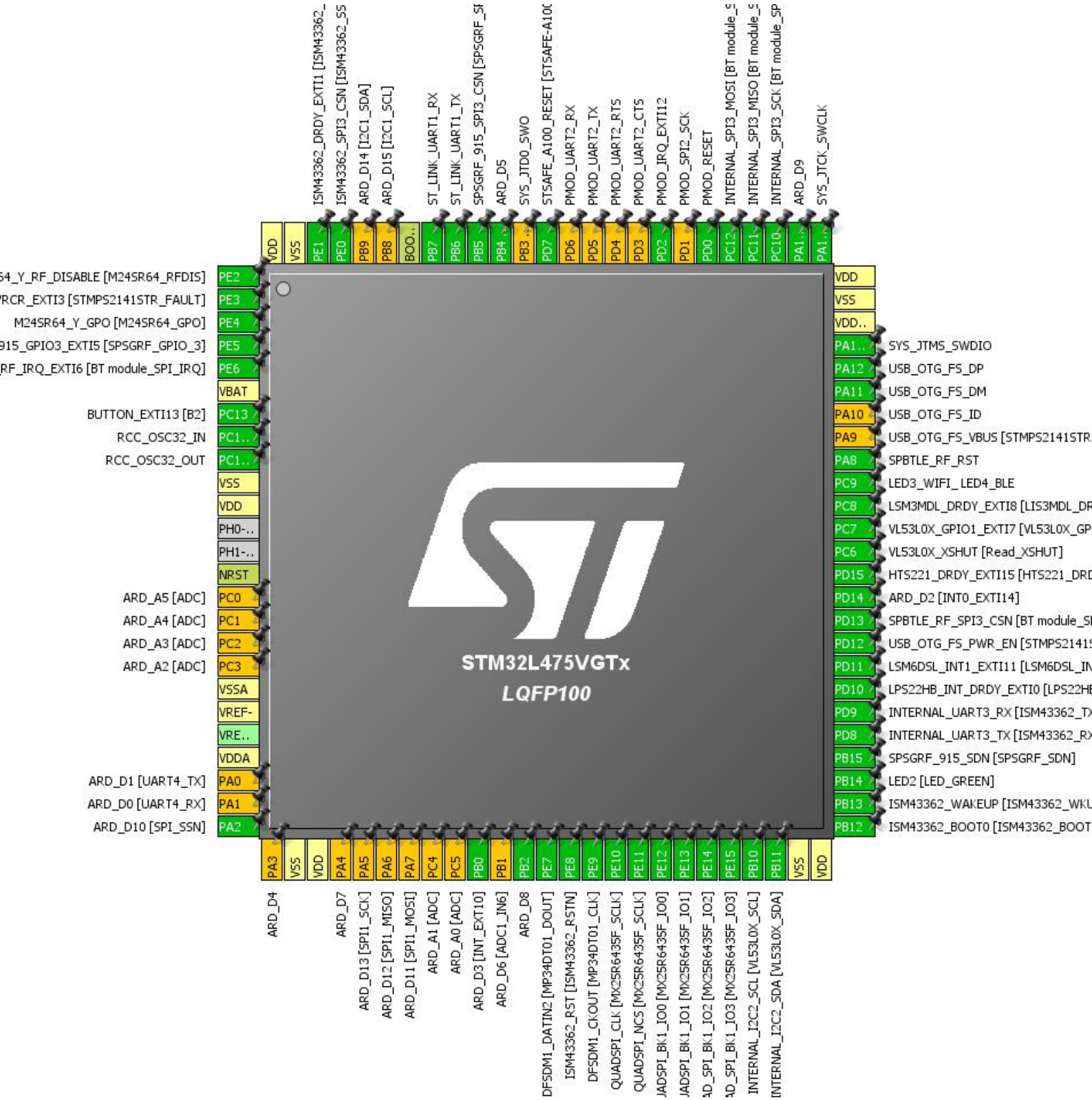
## 1.1. Project

| | |
|---|---|
| Project Name | freertos_demo |
| Board Name | B-L475E-IOT01A |
| Generated with: | STM32CubeMX 4.27.0 |
| Date | 05/23/2019 |

## 1.2. MCU

| | |
|---|---|
| MCU Series | STM32L4 |
| MCU Line | STM32L4x5 |
| MCU name | STM32L475VGTx |
| MCU Package | LQFP100 |
| MCU Pin number | 100 |

## 2. Pinout Configuration



# 3. Pins Configuration

| Pin Number LQFP100 | Pin Name (function after reset) | Pin Type | Alternate Function(s) | Label |
|---|---|---|---|---|
| 1 | PE2 * | I/O | GPIO_Output | M24SR64_Y_RF_DISABLE [M24SR64_RFDIS] |
| 2 | PE3 | I/O | GPIO_EXTI3 | USB_OTG_FS_OVRCR_EXTI3 [STMPS2141STR_FAULT] |
| 3 | PE4 * | I/O | GPIO_Output | M24SR64_Y_GPO [M24SR64_GPO] |
| 4 | PE5 | I/O | GPIO_EXTI5 | SPSGRF_915_GPIO3_EXTI5 [SPSGRF_GPIO_3] |
| 5 | PE6 | I/O | GPIO_EXTI6 | SPBTLE_RF_IRQ_EXTI6 [BT module_SPI_IRQ] |
| 6 | VBAT | Power | | |
| 7 | PC13 | I/O | GPIO_EXTI13 | BUTTON_EXTI13 [B2] |
| 8 | PC14-OSC32_IN (PC14) | I/O | RCC_OSC32_IN | |
| 9 | PC15-OSC32_OUT (PC15) | I/O | RCC_OSC32_OUT | |
| 10 | VSS | Power | | |
| 11 | VDD | Power | | |
| 14 | NRST | Reset | | |
| 15 | PC0 ** | I/O | ADC1_IN1 | ARD_A5 [ADC] |
| 16 | PC1 ** | I/O | ADC1_IN2 | ARD_A4 [ADC] |
| 17 | PC2 ** | I/O | ADC1_IN3 | ARD_A3 [ADC] |
| 18 | PC3 ** | I/O | ADC1_IN4 | ARD_A2 [ADC] |
| 19 | VSSA | Power | | |
| 20 | VREF- | Power | | |
| 22 | VDDA | Power | | |
| 23 | PA0 ** | I/O | UART4_TX | ARD_D1 [UART4_TX] |
| 24 | PA1 ** | I/O | UART4_RX | ARD_D0 [UART4_RX] |
| 25 | PA2 * | I/O | GPIO_Output | ARD_D10 [SPI_SSN] |
| 26 | PA3 ** | I/O | TIM2_CH4 | ARD_D4 |
| 27 | VSS | Power | | |
| 28 | VDD | Power | | |
| 29 | PA4 ** | I/O | ADC1_IN9 | ARD_D7 |
| 30 | PA5 ** | I/O | SPI1_SCK | ARD_D13 [SPI1_SCK] |
| 31 | PA6 ** | I/O | SPI1_MISO | ARD_D12 [SPI1_MISO] |
| 32 | PA7 ** | I/O | SPI1_MOSI | ARD_D11 [SPI1_MOSI] |
| 33 | PC4 ** | I/O | ADC1_IN13 | ARD_A1 [ADC] |
| 34 | PC5 ** | I/O | ADC1_IN14 | ARD_A0 [ADC] |

| Pin Number LQFP100 | Pin Name (function after reset) | Pin Type | Alternate Function(s) | Label |
|---|---|---|---|---|
| 35 | PB0 | I/O | GPIO_EXTI0 | ARD_D3 [INT_EXT10] |
| 36 | PB1 ** | I/O | ADC1_IN16 | ARD_D6 [ADC1_IN6] |
| 37 | PB2 * | I/O | GPIO_Output | ARD_D8 |
| 38 | PE7 | I/O | DFSDM1_DATIN2 | DFSDM1_DATIN2 [MP34DT01_DOUT] |
| 39 | PE8 * | I/O | GPIO_Output | ISM43362_RST [ISM43362_RSTN] |
| 40 | PE9 | I/O | DFSDM1_CKOUT | DFSDM1_CKOUT [MP34DT01_CLK] |
| 41 | PE10 | I/O | QUADSPI_CLK | QUADSPI_CLK [MX25R6435F_SCLK] |
| 42 | PE11 | I/O | QUADSPI_NCS | QUADSPI_NCS [MX25R6435F_SCLK] |
| 43 | PE12 | I/O | QUADSPI_BK1_IO0 | OQUADSPI_BK1_IO0 [MX25R6435F_IO0] |
| 44 | PE13 | I/O | QUADSPI_BK1_IO1 | QUADSPI_BK1_IO1 [MX25R6435F_IO1] |
| 45 | PE14 | I/O | QUADSPI_BK1_IO2 | QUAD_SPI_BK1_IO2 [MX25R6435F_IO2] |
| 46 | PE15 | I/O | QUADSPI_BK1_IO3 | QUAD_SPI_BK1_IO3 [MX25R6435F_IO3] |
| 47 | PB10 | I/O | I2C2_SCL | INTERNAL_I2C2_SCL [VL53L0X_SCL] |
| 48 | PB11 | I/O | I2C2_SDA | INTERNAL_I2C2_SDA [VL53L0X_SDA] |
| 49 | VSS | Power | | |
| 50 | VDD | Power | | |
| 51 | PB12 * | I/O | GPIO_Output | ISM43362_BOOT0 [ISM43362_BOOT] |
| 52 | PB13 * | I/O | GPIO_Output | ISM43362_WAKEUP [ISM43362_WKUP] |
| 53 | PB14 * | I/O | GPIO_Output | LED2 [LED_GREEN] |
| 54 | PB15 * | I/O | GPIO_Output | SPSGRF_915_SDN [SPSGRF_SDN] |
| 55 | PD8 | I/O | USART3_TX | INTERNAL_UART3_TX [ISM43362_RX] |
| 56 | PD9 | I/O | USART3_RX | INTERNAL_UART3_RX [ISM43362_TX] |
| 57 | PD10 | I/O | GPIO_EXTI10 | LPS22HB_INT_DRDY_EXTI 0 [LPS22HB_INT_DRDY] |
| 58 | PD11 | I/O | GPIO_EXTI11 | LSM6DSL_INT1_EXTI11 [LSM6DSL_INT1] |

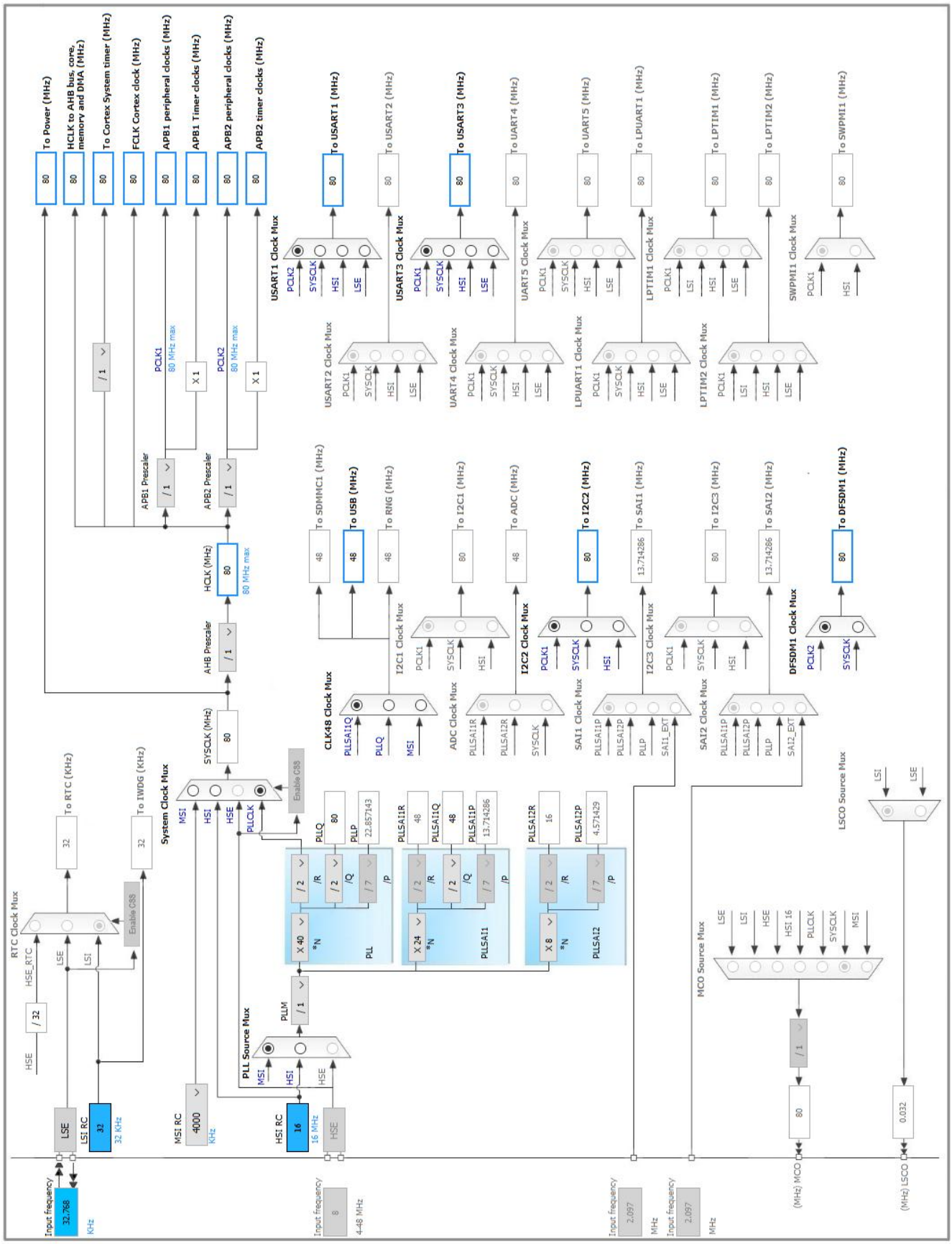
| Pin Number LQFP100 | Pin Name (function after reset) | Pin Type | Alternate Function(s) | Label |
|---|---|---|---|---|
| 59 | PD12 * | I/O | GPIO_Output | USB_OTG_FS_PWR_EN [STMPS2141STR_EN] |
| 60 | PD13 * | I/O | GPIO_Output | SPBTLE_RF_SPI3_CSN [BT module_SPI_CS] |
| 61 | PD14 | I/O | GPIO_EXTI14 | ARD_D2 [INT0_EXTI14] |
| 62 | PD15 | I/O | GPIO_EXTI15 | HTS221_DRDY_EXTI15 [HTS221_DRDY] |
| 63 | PC6 * | I/O | GPIO_Output | VL53L0X_XSHUT [Read_XSHUT] |
| 64 | PC7 | I/O | GPIO_EXTI7 | VL53L0X_GPIO1_EXTI7 [VL53L0X_GPIO1] |
| 65 | PC8 | I/O | GPIO_EXTI8 | LSM3MDL_DRDY_EXTI8 [LIS3MDL_DRDY] |
| 66 | PC9 * | I/O | GPIO_Output | LED3_WIFI_ LED4_BLE |
| 67 | PA8 * | I/O | GPIO_Output | SPBTLE_RF_RST |
| 68 | PA9 ** | I/O | USB_OTG_FS_VBUS | USB_OTG_FS_VBUS [STMPS2141STR_OUT] |
| 69 | PA10 ** | I/O | USB_OTG_FS_ID | USB_OTG_FS_ID |
| 70 | PA11 | I/O | USB_OTG_FS_DM | USB_OTG_FS_DM |
| 71 | PA12 | I/O | USB_OTG_FS_DP | USB_OTG_FS_DP |
| 72 | PA13 (JTMS-SWDIO) | I/O | SYS_JTMS-SWDIO | SYS_JTMS_SWDIO |
| 73 | VDDUSB | Power | | |
| 74 | VSS | Power | | |
| 75 | VDD | Power | | |
| 76 | PA14 (JTCK-SWCLK) | I/O | SYS_JTCK-SWCLK | SYS_JTCK_SWCLK |
| 77 | PA15 (JTDI) * | I/O | GPIO_Output | ARD_D9 |
| 78 | PC10 | I/O | SPI3_SCK | INTERNAL_SPI3_SCK [BT module_SPI_SCLK] |
| 79 | PC11 | I/O | SPI3_MISO | INTERNAL_SPI3_MISO [BT module_SPI_MISO] |
| 80 | PC12 | I/O | SPI3_MOSI | INTERNAL_SPI3_MOSI [BT module_SPI_MOSI] |
| 81 | PD0 * | I/O | GPIO_Output | PMOD_RESET |
| 82 | PD1 ** | I/O | SPI2_SCK | PMOD_SPI2_SCK |
| 83 | PD2 | I/O | GPIO_EXTI2 | PMOD_IRQ_EXTI12 |
| 84 | PD3 ** | I/O | USART2_CTS | PMOD_UART2_CTS |
| 85 | PD4 ** | I/O | USART2_RTS | PMOD_UART2_RTS |
| 86 | PD5 ** | I/O | USART2_TX | PMOD_UART2_TX |
| 87 | PD6 ** | I/O | USART2_RX | PMOD_UART2_RX |
| 88 | PD7 * | I/O | GPIO_Output | STSAFE_A100_RESET [STSAFE-A100_RESET] |

| Pin Number LQFP100 | Pin Name (function after reset) | Pin Type | Alternate Function(s) | Label |
|---|---|---|---|---|
| 89 | PB3 (JTDO-TRACESWO) ** | I/O | SYS_JTDO-SWO | SYS_JTD0_SWO |
| 90 | PB4 (NJTRST) * | I/O | GPIO_Output | ARD_D5 |
| 91 | PB5 * | I/O | GPIO_Output | SPSGRF_915_SPI3_CSN [SPSGRF_SPI_CS] |
| 92 | PB6 | I/O | USART1_TX | ST_LINK_UART1_TX |
| 93 | PB7 | I/O | USART1_RX | ST_LINK_UART1_RX |
| 94 | BOOT0 | Boot | | |
| 95 | PB8 ** | I/O | I2C1_SCL | ARD_D15 [I2C1_SCL] |
| 96 | PB9 ** | I/O | I2C1_SDA | ARD_D14 [I2C1_SDA] |
| 97 | PE0 * | I/O | GPIO_Output | ISM43362_SPI3_CSN [ISM43362_SSN] |
| 98 | PE1 | I/O | GPIO_EXTI1 | ISM43362_DRDY_EXTI1 [ISM43362_DATARDY] |
| 99 | VSS | Power | | |
| 100 | VDD | Power | | |

* The pin is affected with an I/O function

** The pin is affected with a peripheral function but no peripheral mode is activated

# 4. Clock Tree Configuration



# 5. IPs and Middleware Configuration

## 5.1. DFSDM1

**mode: PDM/SPI Input from ch2 and Internal Clock**

**mode: CKOUT**

### 5.1.1. Filter 0:

**regular channel selection:**

| | |
|---|---|
| regular channel selection | - None - |

**injected channel selection:**

| | |
|---|---|
| Channel0 as injected channel | Disable |
| Channel1 as injected channel | Disable |
| Channel2 as injected channel | Disable |
| Channel3 as injected channel | Disable |
| Channel4 as injected channel | Disable |
| Channel5 as injected channel | Disable |
| Channel6 as injected channel | Disable |
| Channel7 as injected channel | Disable |

### 5.1.2. Filter 1:

**regular channel selection:**

| | |
|---|---|
| regular channel selection | - None - |

**injected channel selection:**

| | |
|---|---|
| Channel0 as injected channel | Disable |
| Channel1 as injected channel | Disable |
| Channel2 as injected channel | Disable |
| Channel3 as injected channel | Disable |
| Channel4 as injected channel | Disable |
| Channel5 as injected channel | Disable |
| Channel6 as injected channel | Disable |
| Channel7 as injected channel | Disable |

### 5.1.3. Filter 2:

**regular channel selection:**

| | |
|---|---|
| regular channel selection | - None - |

**injected channel selection:**

| | |
|---|---|
| Channel0 as injected channel | Disable |
| Channel1 as injected channel | Disable |

| | |
|---|---|
| Channel2 as injected channel | Disable |
| Channel3 as injected channel | Disable |
| Channel4 as injected channel | Disable |
| Channel5 as injected channel | Disable |
| Channel6 as injected channel | Disable |
| Channel7 as injected channel | Disable |

### 5.1.4. Filter 3:

#### regular channel selection:

| | |
|---|---|
| regular channel selection | - None - |

#### injected channel selection:

| | |
|---|---|
| Channel0 as injected channel | Disable |
| Channel1 as injected channel | Disable |
| Channel2 as injected channel | Disable |
| Channel3 as injected channel | Disable |
| Channel4 as injected channel | Disable |
| Channel5 as injected channel | Disable |
| Channel6 as injected channel | Disable |
| Channel7 as injected channel | Disable |

### 5.1.5. Output Clock:

#### Output Clock parameters:

| | |
|---|---|
| Selection | Source for ouput clock is system clock |
| Divider | 2 |

### 5.1.6. Channel 1:

#### Channel 1 parameters:

| | |
|---|---|
| Type | SPI with rising edge |
| Spi Clock | Internal SPI clock |
| Offset | 0 |
| Right Bit Shift | **0x00 *** |

#### Analog watchdog parameters:

| | |
|---|---|
| Filter Order | FastSinc filter type |
| Oversampling | 1 |

## 5.2. I2C2

### I2C: I2C

### 5.2.1. Parameter Settings:

**Timing configuration:**

| | |
|---|---|
| I2C Speed Mode | Standard Mode |
| I2C Speed Frequency (KHz) | 100 |
| Rise Time (ns) | 0 |
| Fall Time (ns) | 0 |
| Coefficient of Digital Filter | 0 |
| Analog Filter | Enabled |
| Timing | 0x10909CEC |

**Slave Features:**

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

## 5.3. QUADSPI

### Single Bank: Quad SPI Line

### 5.3.1. Parameter Settings:

**General Parameters:**

| | |
|---|---|
| Clock Prescaler | 255 |
| Fifo Threshold | 1 |
| Sample Shifting | No Sample Shifting |
| Flash Size | 1 |
| Chip Select High Time | 1 Cycle |
| Clock Mode | Low |

## 5.4. RCC

### Low Speed Clock (LSE) : Crystal/Ceramic Resonator

### 5.4.1. Parameter Settings:

### System Parameters:

| | |
|---|---|
| VDD voltage (V) | 3.3 |
| Instruction Cache | Enabled |
| Prefetch Buffer | Disabled |
| Data Cache | Enabled |
| Flash Latency(WS) | 4 WS (5 CPU cycle) |

### RCC Parameters:

| | |
|---|---|
| HSI Calibration Value | 16 |
| MSI Calibration Value | 0 |
| MSI Auto Calibration | Enabled |
| HSE Startup Timout Value (ms) | 100 |
| LSE Startup Timout Value (ms) | 5000 |
| LSE Drive Capability | LSE oscillator low drive capability |

### Power Parameters:

| | |
|---|---|
| Power Regulator Voltage Scale | Power Regulator Voltage Scale 1 |

## *5.5. SPI3*

**Mode: Full-Duplex Master**

### 5.5.1. Parameter Settings:

### Basic Parameters:

| | |
|---|---|
| Frame Format | Motorola |
| Data Size | 4 Bits |
| First Bit | MSB First |

### Clock Parameters:

| | |
|---|---|
| Prescaler (for Baud Rate) | 2 |
| Baud Rate | **40.0 MBits/s *** |
| Clock Polarity (CPOL) | Low |
| Clock Phase (CPHA) | 1 Edge |

### Advanced Parameters:

| | |
|---|---|
| CRC Calculation | Disabled |
| NSSP Mode | Enabled |
| NSS Signal Type | Software |

## *5.6. SYS*

**Debug: Serial Wire**
**Timebase Source: SysTick**

## *5.7. TIM7*

**mode: Activated**

### 5.7.1. Parameter Settings:

**Counter Settings:**

| | |
|---|---|
| Prescaler (PSC - 16 bits value) | 0 |
| Counter Mode | Up |
| Counter Period (AutoReload Register - 16 bits value ) | 0 |
| auto-reload preload | Disable |

**Trigger Output (TRGO) Parameters:**

| | |
|---|---|
| Trigger Event Selection | Reset (UG bit from TIMx_EGR) |

## *5.8. USART1*

**Mode: Asynchronous**

### 5.8.1. 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 |
| Single Sample | Disable |

**Advanced Features:**

| | |
|---|---|
| Auto Baudrate | Disable |
| TX Pin Active Level Inversion | Disable |
| RX Pin Active Level Inversion | Disable |
| Data Inversion | Disable |
| TX and RX Pins Swapping | Disable |
| Overrun | Enable |
| DMA on RX Error | Enable |
| MSB First | Disable |

## 5.9. USART3

### Mode: Asynchronous

### 5.9.1. 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 |
| Single Sample | Disable |

**Advanced Features:**

| | |
|---|---|
| Auto Baudrate | Disable |
| TX Pin Active Level Inversion | Disable |
| RX Pin Active Level Inversion | Disable |
| Data Inversion | Disable |
| TX and RX Pins Swapping | Disable |
| Overrun | Enable |
| DMA on RX Error | Enable |
| MSB First | Disable |

## 5.10. USB_OTG_FS

### Mode: Device_Only

### 5.10.1. Parameter Settings:

| | |
|---|---|
| Speed | Full Speed 12MBit/s |
| Endpoint 0 Max Packet size | 64 Bytes |
| Enable internal IP DMA | Disabled |
| Low power | Disabled |
| Link Power Management | Disabled |
| VBUS sensing | Disabled |
| Signal start of frame | Disabled |

## 5.11. FREERTOS

**mode: Enabled**

### 5.11.1. Config parameters:

**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 |
| TOTAL_HEAP_SIZE | 3000 |
| 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 |

### 5.11.2. 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 |

## *5.12. STMicroelectronics.X-CUBE-MEMS1.5.1.0*

**mode: BoardOoComponentJjMEMS**

*** User modified value**

# 6. System Configuration

## 6.1. GPIO configuration

| IP | Pin | Signal | GPIO mode | GPIO pull/up pull down | Max Speed | User Label |
|---|---|---|---|---|---|---|
| DFSDM1 | PE7 | DFSDM1_DATIN2 | Alternate Function Push Pull | No pull-up and no pull-down | Low | DFSDM1_DATIN2 [MP34DT01_DOUT] |
| | PE9 | DFSDM1_CKOUT | Alternate Function Push Pull | No pull-up and no pull-down | Low | DFSDM1_CKOUT [MP34DT01_CLK] |
| I2C2 | PB10 | I2C2_SCL | Alternate Function Open Drain | Pull-up | **Very High *** | INTERNAL_I2C2_SCL [VL53L0X_SCL] |
| | PB11 | I2C2_SDA | Alternate Function Open Drain | Pull-up | **Very High *** | INTERNAL_I2C2_SDA [VL53L0X_SDA] |
| QUADSPI | PE10 | QUADSPI_CLK | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | QUADSPI_CLK [MX25R6435F_SCLK] |
| | PE11 | QUADSPI_NCS | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | QUADSPI_NCS [MX25R6435F_SCLK] |
| | PE12 | QUADSPI_BK1_IO0 | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | OQUADSPI_BK1_IO0 [MX25R6435F_IO0] |
| | PE13 | QUADSPI_BK1_IO1 | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | QUADSPI_BK1_IO1 [MX25R6435F_IO1] |
| | PE14 | QUADSPI_BK1_IO2 | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | QUAD_SPI_BK1_IO2 [MX25R6435F_IO2] |
| | PE15 | QUADSPI_BK1_IO3 | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | QUAD_SPI_BK1_IO3 [MX25R6435F_IO3] |
| RCC | PC14-OSC32_IN (PC14) | RCC_OSC32_IN | n/a | n/a | n/a | |
| | PC15-OSC32_OUT (PC15) | RCC_OSC32_OUT | n/a | n/a | n/a | |
| SPI3 | PC10 | SPI3_SCK | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | INTERNAL_SPI3_SCK [BT module_SPI_SCLK] |
| | PC11 | SPI3_MISO | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | INTERNAL_SPI3_MISO [BT module_SPI_MISO] |
| | PC12 | SPI3_MOSI | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | INTERNAL_SPI3_MOSI [BT module_SPI_MOSI] |
| SYS | PA13 (JTMS-SWDIO) | SYS_JTMS-SWDIO | n/a | n/a | n/a | SYS_JTMS_SWDIO |
| | | | | | | |

| IP | Pin | Signal | GPIO mode | GPIO pull/up pull down | Max Speed | User Label |
|---|---|---|---|---|---|---|
| | PA14 (JTCK-SWCLK) | SYS_JTCK-SWCLK | n/a | n/a | n/a | SYS_JTCK_SWCLK |
| USART1 | PB6 | USART1_TX | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | ST_LINK_UART1_TX |
| | PB7 | USART1_RX | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | ST_LINK_UART1_RX |
| USART3 | PD8 | USART3_TX | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | INTERNAL_UART3_TX [ISM43362_RX] |
| | PD9 | USART3_RX | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | INTERNAL_UART3_RX [ISM43362_TX] |
| USB_OTG_FS | PA11 | USB_OTG_FS_DM | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | USB_OTG_FS_DM |
| | PA12 | USB_OTG_FS_DP | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | USB_OTG_FS_DP |
| Single Mapped Signals | PC0 | ADC1_IN1 | Analog mode for ADC conversion | No pull-up and no pull-down | n/a | ARD_A5 [ADC] |
| | PC1 | ADC1_IN2 | Analog mode for ADC conversion | No pull-up and no pull-down | n/a | ARD_A4 [ADC] |
| | PC2 | ADC1_IN3 | Analog mode for ADC conversion | No pull-up and no pull-down | n/a | ARD_A3 [ADC] |
| | PC3 | ADC1_IN4 | Analog mode for ADC conversion | No pull-up and no pull-down | n/a | ARD_A2 [ADC] |
| | PA0 | UART4_TX | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | ARD_D1 [UART4_TX] |
| | PA1 | UART4_RX | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | ARD_D0 [UART4_RX] |
| | PA3 | TIM2_CH4 | Alternate Function Push Pull | No pull-up and no pull-down | Low | ARD_D4 |
| | PA4 | ADC1_IN9 | Analog mode for ADC conversion | No pull-up and no pull-down | n/a | ARD_D7 |
| | PA5 | SPI1_SCK | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | ARD_D13 [SPI1_SCK] |
| | PA6 | SPI1_MISO | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | ARD_D12 [SPI1_MISO] |
| | PA7 | SPI1_MOSI | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | ARD_D11 [SPI1_MOSI] |
| | PC4 | ADC1_IN13 | Analog mode for ADC conversion | No pull-up and no pull-down | **n/a** | ARD_A1 [ADC] |
| | PC5 | ADC1_IN14 | Analog mode for ADC conversion | No pull-up and no pull-down | **n/a** | ARD_A0 [ADC] |
| | PB1 | ADC1_IN16 | Analog mode for ADC | No pull-up and no pull-down | **n/a** | ARD_D6 [ADC1_IN6] |

| IP | Pin | Signal | GPIO mode | GPIO pull/up pull down | Max Speed | User Label |
|---|---|---|---|---|---|---|
| | | | conversion | | | |
| | PA9 | USB_OTG_FS_VBUS | Input mode | No pull-up and no pull-down | **n/a** | USB_OTG_FS_VBUS [STMPS2141STR_OUT] |
| | PA10 | USB_OTG_FS_ID | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | USB_OTG_FS_ID |
| | PD1 | SPI2_SCK | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | PMOD_SPI2_SCK |
| | PD3 | USART2_CTS | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | PMOD_UART2_CTS |
| | PD4 | USART2_RTS | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | PMOD_UART2_RTS |
| | PD5 | USART2_TX | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | PMOD_UART2_TX |
| | PD6 | USART2_RX | Alternate Function Push Pull | No pull-up and no pull-down | **Very High *** | PMOD_UART2_RX |
| | PB3 (JTDO-TRACESWO) | SYS_JTDO-SWO | n/a | n/a | **n/a** | SYS_JTD0_SWO |
| | PB8 | I2C1_SCL | Alternate Function Open Drain | Pull-up | **Very High *** | ARD_D15 [I2C1_SCL] |
| | PB9 | I2C1_SDA | Alternate Function Open Drain | Pull-up | **Very High *** | ARD_D14 [I2C1_SDA] |
| GPIO | PE2 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | M24SR64_Y_RF_DISABLE [M24SR64_RFDIS] |
| | PE3 | GPIO_EXTI3 | External Interrupt Mode with Rising edge trigger detection | No pull-up and no pull-down | n/a | USB_OTG_FS_OVRCR_EXTI3 [STMPS2141STR_FAULT] |
| | PE4 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | M24SR64_Y_GPO [M24SR64_GPO] |
| | PE5 | GPIO_EXTI5 | External Interrupt Mode with Rising edge trigger detection | No pull-up and no pull-down | n/a | SPSGRF_915_GPIO3_EXTI5 [SPSGRF_GPIO_3] |
| | PE6 | GPIO_EXTI6 | External Interrupt Mode with Rising edge trigger detection | No pull-up and no pull-down | n/a | SPBTLE_RF_IRQ_EXTI6 [BT module_SPI_IRQ] |
| | PC13 | GPIO_EXTI13 | **External Interrupt Mode with Falling edge trigger detection** | No pull-up and no pull-down | n/a | BUTTON_EXTI13 [B2] |
| | PA2 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | ARD_D10 [SPI_SSN] |
| | PB0 | GPIO_EXTI0 | External Interrupt Mode with Rising edge trigger detection | No pull-up and no pull-down | n/a | ARD_D3 [INT_EXT10] |
| | PB2 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | ARD_D8 |
| | PE8 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | ISM43362_RST |

| IP | Pin | Signal | GPIO mode | GPIO pull/up pull down | Max Speed | User Label |
|---|---|---|---|---|---|---|
| | | | | | | [ISM43362_RSTN] |
| | PB12 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | ISM43362_BOOT0 [ISM43362_BOOT] |
| | PB13 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | ISM43362_WAKEUP [ISM43362_WKUP] |
| | PB14 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | LED2 [LED_GREEN] |
| | PB15 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | SPSGRF_915_SDN [SPSGRF_SDN] |
| | PD10 | GPIO_EXTI10 | External Interrupt Mode with Rising edge trigger detection | No pull-up and no pull-down | n/a | LPS22HB_INT_DRDY_EXTI0 [LPS22HB_INT_DRDY] |
| | PD11 | GPIO_EXTI11 | External Interrupt Mode with Rising edge trigger detection | No pull-up and no pull-down | n/a | LSM6DSL_INT1_EXTI11 [LSM6DSL_INT1] |
| | PD12 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | USB_OTG_FS_PWR_EN [STMPS2141STR_EN] |
| | PD13 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | SPBTLE_RF_SPI3_CSN [BT module_SPI_CS] |
| | PD14 | GPIO_EXTI14 | External Interrupt Mode with Rising edge trigger detection | No pull-up and no pull-down | n/a | ARD_D2 [INT0_EXTI14] |
| | PD15 | GPIO_EXTI15 | External Interrupt Mode with Rising edge trigger detection | No pull-up and no pull-down | n/a | HTS221_DRDY_EXTI15 [HTS221_DRDY] |
| | PC6 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | VL53L0X_XSHUT [Read_XSHUT] |
| | PC7 | GPIO_EXTI7 | External Interrupt Mode with Rising edge trigger detection | No pull-up and no pull-down | n/a | VL53L0X_GPIO1_EXTI7 [VL53L0X_GPIO1] |
| | PC8 | GPIO_EXTI8 | External Interrupt Mode with Rising edge trigger detection | No pull-up and no pull-down | n/a | LSM3MDL_DRDY_EXTI8 [LIS3MDL_DRDY] |
| | PC9 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | LED3_WIFI_ LED4_BLE |
| | PA8 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | SPBTLE_RF_RST |
| | PA15 (JTDI) | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | ARD_D9 |
| | PD0 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | PMOD_RESET |
| | PD2 | GPIO_EXTI2 | External Interrupt Mode with Rising edge trigger detection | No pull-up and no pull-down | n/a | PMOD_IRQ_EXTI12 |
| | PD7 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | STSAFE_A100_RESET [STSAFE-A100_RESET] |
| | PB4 (NJTRST) | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | ARD_D5 |
| | PB5 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | SPSGRF_915_SPI3_CSN [SPSGRF_SPI_CS] |
| | PE0 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | ISM43362_SPI3_CSN [ISM43362_SSN] |
| | PE1 | GPIO_EXTI1 | External Interrupt Mode with Rising edge trigger detection | No pull-up and no pull-down | n/a | ISM43362_DRDY_EXTI1 [ISM43362_DATARDY] |

## 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 |
| Prefetch 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 |
| EXTI line[9:5] interrupts | true | 5 | 0 |
| EXTI line[15:10] interrupts | true | 5 | 0 |
| PVD/PVM1/PVM2/PVM3/PVM4 interrupts through EXTI lines 16/35/36/37/38 | unused | | |
| Flash global interrupt | unused | | |
| RCC global interrupt | unused | | |
| EXTI line0 interrupt | unused | | |
| EXTI line1 interrupt | unused | | |
| EXTI line2 interrupt | unused | | |
| EXTI line3 interrupt | unused | | |
| I2C2 event interrupt | unused | | |
| I2C2 error interrupt | unused | | |
| USART1 global interrupt | unused | | |
| USART3 global interrupt | unused | | |
| SPI3 global interrupt | unused | | |
| TIM7 global interrupt | unused | | |
| USB OTG FS global interrupt | unused | | |
| QUADSPI global interrupt | unused | | |
| FPU global interrupt | unused | | |

*** User modified value**

# 7. Power Consumption Calculator report

7.1. Microcontroller Selection

| | |
|---|---|
| Series | STM32L4 |
| Line | STM32L4x5 |
| MCU | STM32L475VGTx |
| Datasheet | 027692_Rev2 |

7.2. Parameter Selection

| | |
|---|---|
| Temperature | 25 |
| Vdd | null |

# 8. Software Project

## 8.1. Project Settings

| Name | Value |
|---|---|
| Project Name | freertos_demo |
| Project Folder | C:\Users\andy.kobyljanec.AUTOMATED\Documents\APS- |
| Toolchain / IDE | TrueSTUDIO |
| Firmware Package Name and Version | STM32Cube FW_L4 V1.13.0 |

## 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 |

# 9. Software Pack Report

9.1. Software Pack selected

| Vendor | Name | Version | Component |
|---|---|---|---|
| STMicroelectronics | X-CUBE-MEMS1 | 5.1.0 | Class : Board Component Group : AccGyr SubGroup : LSM6DSL Variant : I2C Version : 5.1.0 Class : Board Component Group : PressTemp SubGroup : LPS22HB Variant : I2C Version : 5.1.0 |