

1. Description

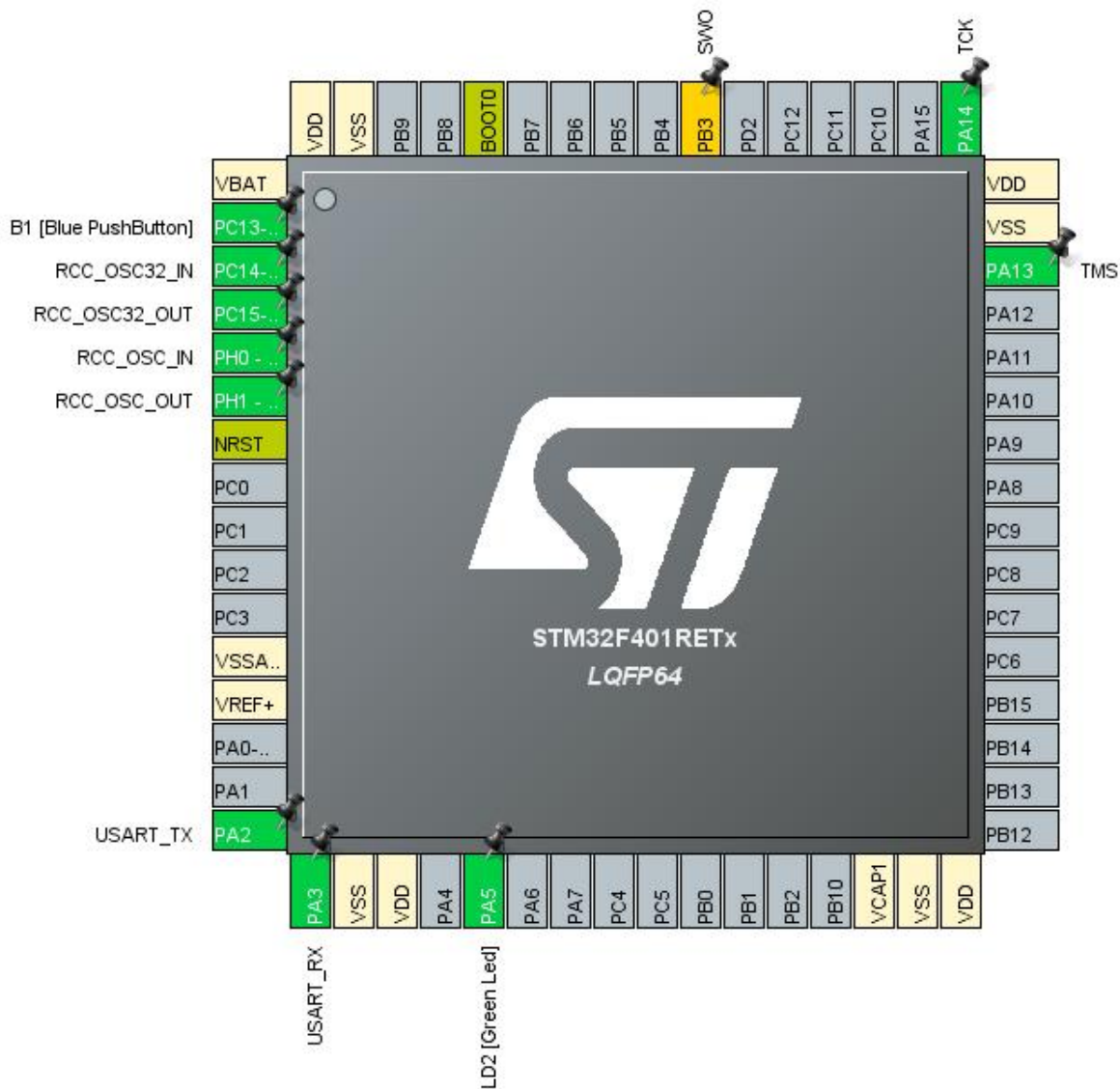
1.1. Project

| | |
|-----------------|-------------------|
| Project Name | cozza_jiqai |
| Board Name | NUCLEO-F401RE |
| Generated with: | STM32CubeMX 5.2.0 |
| Date | 06/15/2019 |

1.2. MCU

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

2. Pinout Configuration



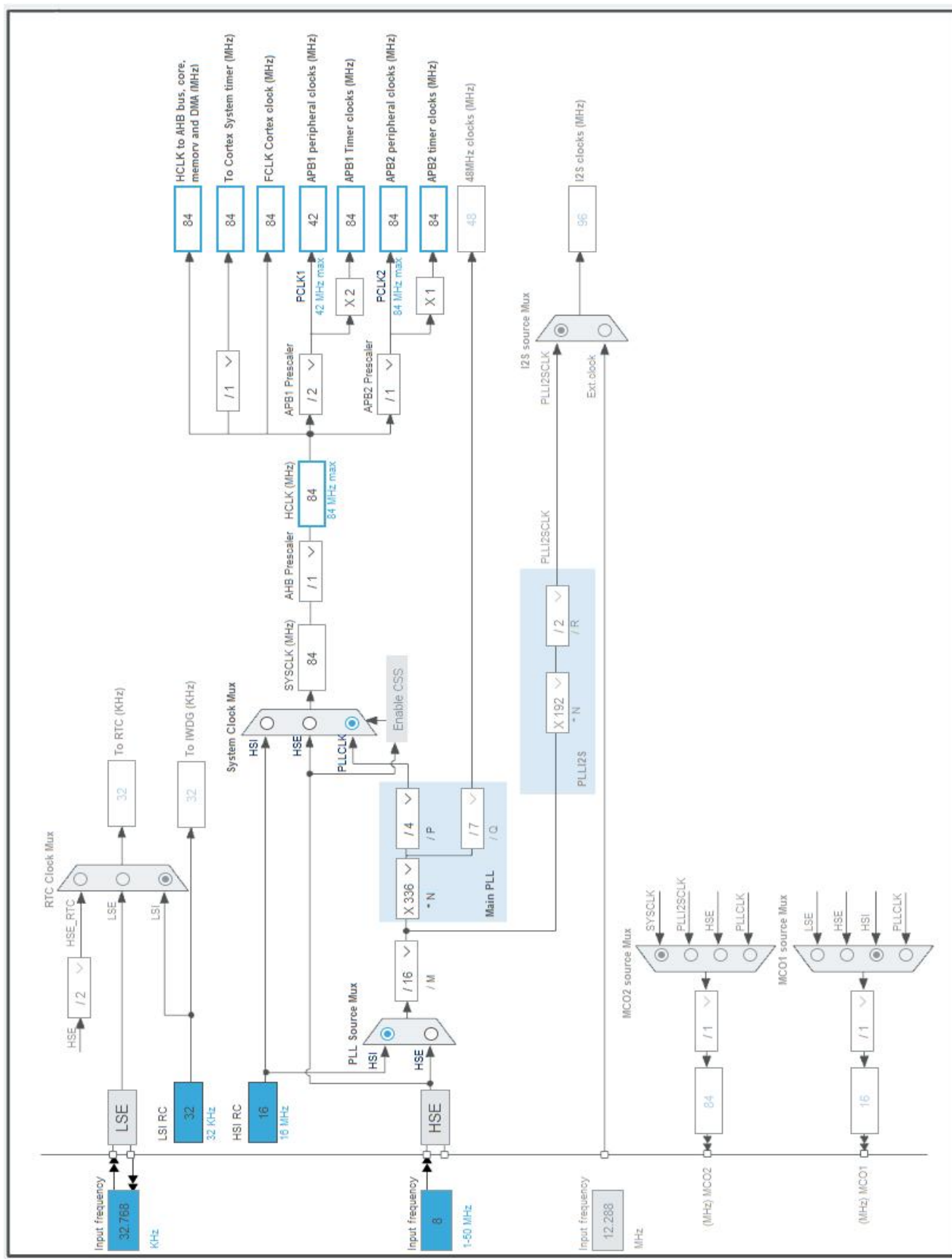
3. Pins Configuration

| 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 | B1 [Blue PushButton] |
| 3 | PC14-OSC32_IN | I/O | RCC_OSC32_IN | |
| 4 | PC15-OSC32_OUT | I/O | RCC_OSC32_OUT | |
| 5 | PH0 - OSC_IN | I/O | RCC_OSC_IN | |
| 6 | PH1 - OSC_OUT | I/O | RCC_OSC_OUT | |
| 7 | NRST | Reset | | |
| 12 | VSSA/VREF- | Power | | |
| 13 | VREF+ | Power | | |
| 16 | PA2 | I/O | USART2_TX | USART_TX |
| 17 | PA3 | I/O | USART2_RX | USART_RX |
| 18 | VSS | Power | | |
| 19 | VDD | Power | | |
| 21 | PA5 * | I/O | GPIO_Output | LD2 [Green Led] |
| 30 | VCAP1 | Power | | |
| 31 | VSS | Power | | |
| 32 | VDD | Power | | |
| 46 | PA13 | I/O | SYS_JTMS-SWDIO | TMS |
| 47 | VSS | Power | | |
| 48 | VDD | Power | | |
| 49 | PA14 | I/O | SYS_JTCK-SWCLK | TCK |
| 55 | PB3 ** | I/O | SYS_JTDO-SWO | SWO |
| 60 | BOOT0 | Boot | | |
| 63 | VSS | Power | | |
| 64 | 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. Software Project

5.1. Project Settings

| Name | Value |
|-----------------------------------|--|
| Project Name | cozza_jiqai |
| Project Folder | C:\Users\grgcz\Desktop\dev_space_win\STM32CubeMX\cozza_jiqai |
| Toolchain / IDE | Makefile |
| Firmware Package Name and Version | STM32Cube FW_F4 V1.24.1 |

5.2. 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 |

6. Power Consumption Calculator report

6.1. Microcontroller Selection

| | |
|-----------|---------------|
| Series | STM32F4 |
| Line | STM32F401 |
| MCU | STM32F401RETx |
| Datasheet | 025644_Rev3 |

6.2. Parameter Selection

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

7. IPs and Middleware Configuration

7.1. CRC

mode: Activated

7.2. RCC

High Speed Clock (HSE): BYPASS Clock Source

Low Speed Clock (LSE) : Crystal/Ceramic Resonator

7.2.1. Parameter Settings:

System Parameters:

| | |
|-------------------|--------------------|
| VDD voltage (V) | 3.3 |
| Instruction Cache | Enabled |
| Prefetch Buffer | Enabled |
| Data Cache | Enabled |
| Flash Latency(WS) | 2 WS (3 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 Regulator Voltage Scale | Power Regulator Voltage Scale 2 |
|-------------------------------|---------------------------------|

7.3. SYS

Debug: Serial Wire

Timebase Source: SysTick

7.4. USART2

Mode: Asynchronous

7.4.1. 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 |

7.5. *STMicroelectronics.X-CUBE-AI.3.4.0*

7.5.1. Global information

Numbers of models: 1
Total flash occupation: 127.02 KBytes
Total complexity: 293148 MACC
Total RAM occupation: 30.13 KBytes

7.5.2. Neural networks

7.5.2.1. network

| | |
|---------------------|---|
| Model kind: | Keras |
| Model type: | Model and Topology |
| Model: | C:\Users\grgcz\Desktop\dev_space_win\AOS_Project\data_collection_driver1\AOS_MovementRecognition\pyCode\saved_models\activityRec_trained_model.h5 |
| MACC: | 293148 MACC |
| Flash: | 127.02 KBytes |
| RAM: | 30.13 KBytes |
| Actual compression: | 3.826 |
| Validation: | Unknown |

*** User modified value**

8. System Configuration

8.1. GPIO configuration

| IP | Pin | Signal | GPIO mode | GPIO pull/up pull down | Max Speed | User Label |
|-----------------------|----------------|----------------|--|-----------------------------|-----------|----------------------|
| RCC | PC14-OSC32_IN | RCC_OSC32_IN | n/a | n/a | n/a | |
| | PC15-OSC32_OUT | RCC_OSC32_OUT | n/a | n/a | n/a | |
| | 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 | TMS |
| | PA14 | SYS_JTCK-SWCLK | n/a | n/a | n/a | TCK |
| USART2 | PA2 | USART2_TX | Alternate Function Push Pull | * | Low | USART_TX |
| | PA3 | USART2_RX | Alternate Function Push Pull | * | Low | USART_RX |
| Single Mapped Signals | PB3 | SYS_JTDO-SWO | n/a | n/a | n/a | SWO |
| GPIO | PC13-ANTI_TAMP | GPIO_EXTI13 | External Interrupt Mode with Falling edge trigger detection | No pull-up and no pull-down | n/a | B1 [Blue PushButton] |
| | PA5 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | LD2 [Green Led] |

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 | 0 | 0 |
| System tick timer | true | 0 | 0 |
| PVD interrupt through EXTI line 16 | unused | | |
| Flash global interrupt | unused | | |
| RCC global interrupt | unused | | |
| USART2 global interrupt | unused | | |
| EXTI line[15:10] interrupts | unused | | |
| FPU global interrupt | unused | | |

* User modified value

9. Software Pack Report

9.1. Software Pack selected

| Vendor | Name | Version | Component |
|--------------------|-----------|---------|--|
| STMicroelectronics | X-CUBE-AI | 3.4.0 | Class : Artificial Intelligence Group : Core Version : 3.4.0 Class : Artificial Intelligence Group : Application Variant : SystemPerformance Version : 3.4.0 |