# 1. Description

## 1.1. Project

| | |
|---|---|
| Project Name | mp3_stm32 |
| Board Name | mp3_stm32 |
| Generated with: | STM32CubeMX 4.16.0 |
| Date | 09/02/2016 |

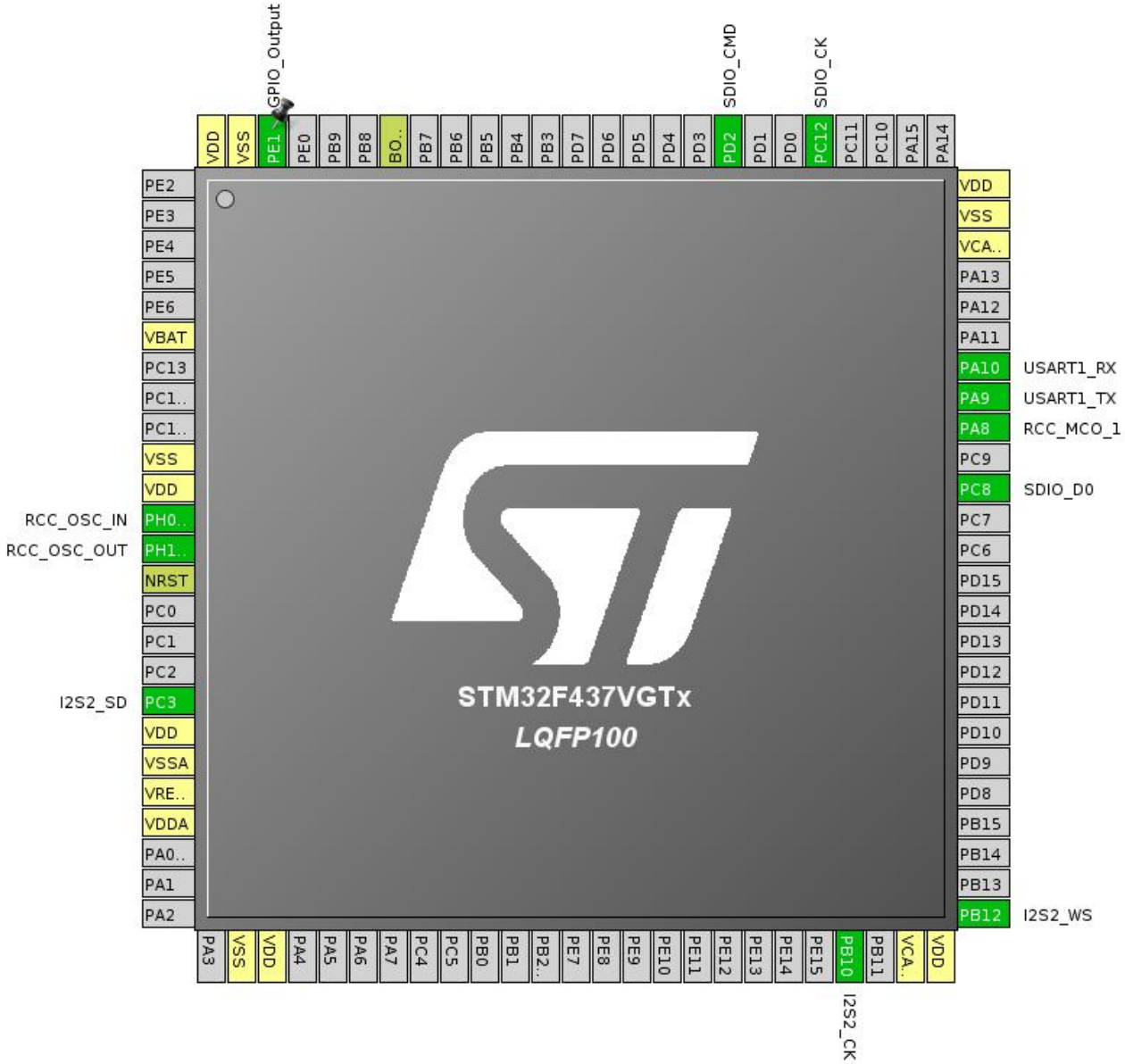
## 1.2. MCU

| | |
|---|---|
| MCU Series | STM32F4 |
| MCU Line | STM32F427/437 |
| MCU name | STM32F437VGTx |
| MCU Package | LQFP100 |
| MCU Pin number | 100 |

## 1.3. Caution

The report was generated although the configuration was in a modified state. It may be not accurate

# 2. Pinout Configuration

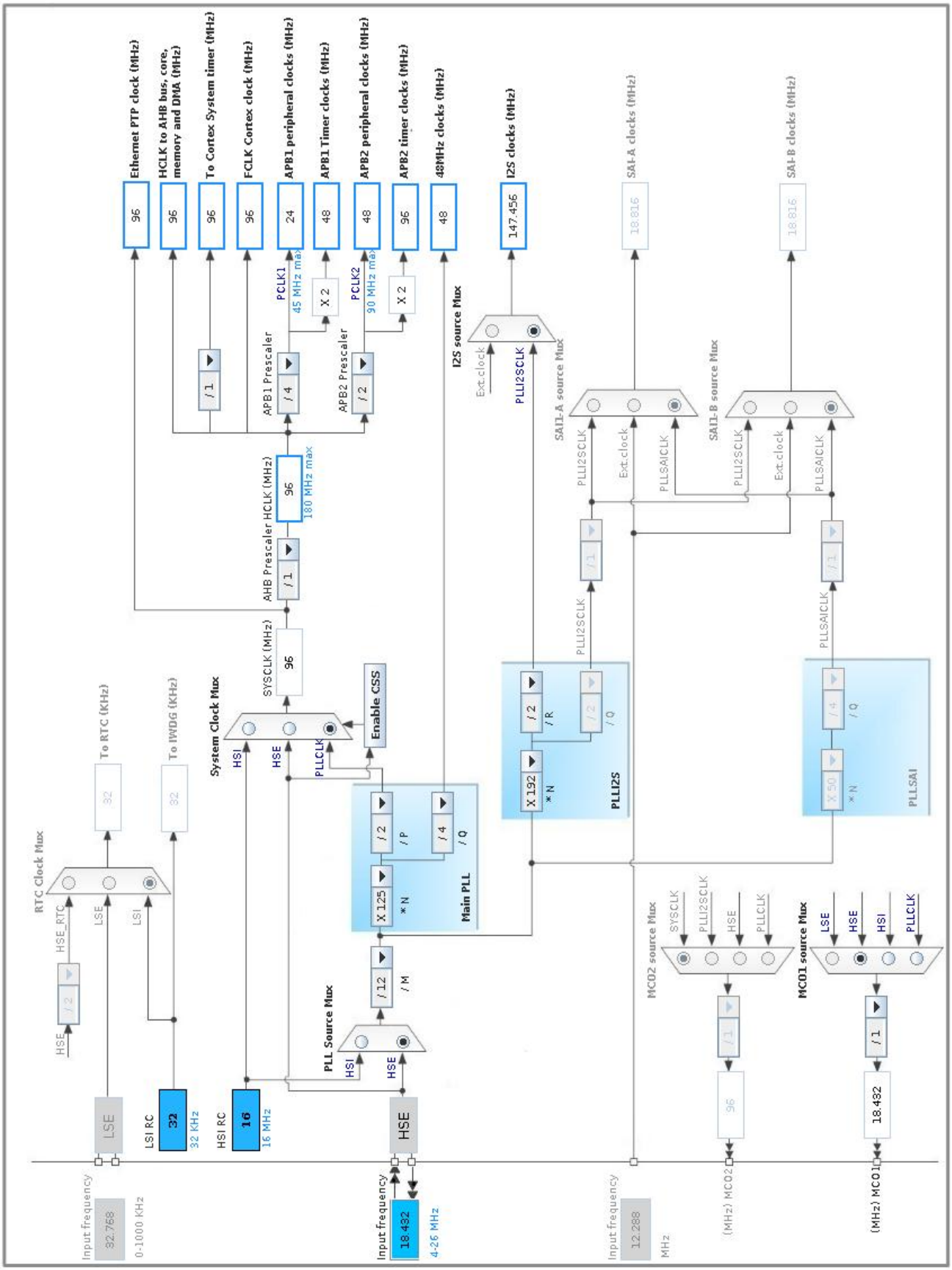


# 3. Pins Configuration

| Pin Number LQFP100 | Pin Name (function after reset) | Pin Type | Alternate 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 | | |
| 18 | PC3 | I/O | I2S2_SD | |
| 19 | VDD | Power | | |
| 20 | VSSA | Power | | |
| 21 | VREF+ | Power | | |
| 22 | VDDA | Power | | |
| 27 | VSS | Power | | |
| 28 | VDD | Power | | |
| 47 | PB10 | I/O | I2S2_CK | |
| 49 | VCAP_1 | Power | | |
| 50 | VDD | Power | | |
| 51 | PB12 | I/O | I2S2_WS | |
| 65 | PC8 | I/O | SDIO_D0 | |
| 67 | PA8 | I/O | RCC_MCO_1 | |
| 68 | PA9 | I/O | USART1_TX | |
| 69 | PA10 | I/O | USART1_RX | |
| 73 | VCAP_2 | Power | | |
| 74 | VSS | Power | | |
| 75 | VDD | Power | | |
| 80 | PC12 | I/O | SDIO_CK | |
| 83 | PD2 | I/O | SDIO_CMD | |
| 94 | BOOT0 | Boot | | |
| 98 | PE1 * | I/O | GPIO_Output | |
| 99 | VSS | Power | | |
| 100 | VDD | Power | | |

* The pin is affected with an I/O function

# 4. Clock Tree Configuration



# 5. IPs and Middleware Configuration

## 5.1. I2S2

**Mode: Half-Duplex Master**

### 5.1.1. Parameter Settings:

**Generic Parameters:**

| | |
|---|---|
| Transmission Mode | Mode Master Transmit |
| Communication Standard | **MSB First (Left Justified) *** |
| Data and Frame Format | 16 Bits Data on 16 Bits Frame |
| Selected Audio Frequency | **48 KHz *** |
| Real Audio Frequency | **48.0 KHz *** |
| Error between Selected and Real | **0.0 % *** |

**Clock Parameters:**

| | |
|---|---|
| Clock Source | I2S PLL Clock |
| Clock Polarity | Low |

## 5.2. RCC

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

**mode: Master Clock Output 1**

### 5.2.1. 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 |
| TIM Prescaler Selection | Disabled |
| HSE Startup Timout Value (ms) | 100 |
| LSE Startup Timout Value (ms) | 5000 |

**Power Parameters:**

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

## 5.3. SDIO

**Mode: SD 1 bit**

### 5.3.1. Parameter Settings:

**SDIO parameters:**

| | |
|---|---|
| SDIOCLK clock divide factor | **3 *** |

## 5.4. SYS

**Timebase Source: SysTick**

## 5.5. USART1

**Mode: Asynchronous**

### 5.5.1. 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 |

## 5.6. FATFS

**mode: SD Card**

### 5.6.1. Set Defines:

**Version:**

| | |
|---|---|
| FATFS version | R0.11 |

**Function Parameters:**

| | |
|---|---|
| FS_TINY (Tiny mode) | Disabled |
| FS_READONLY (Read-only mode) | Disabled |
| FS_MINIMIZE (Minimization level) | Disabled |
| USE_STRFUNC (String functions) | Enabled with LF -> CRLF conversion |
| USE_FIND (Find functions) | Disabled |
| USE_MKFS (Make filesystem function) | Enabled |
| USE_FORWARD (Forward function) | Disabled |
| USE_LABEL (Volume label functions) | Disabled |
| USE_FASTSEEK (Fast seek function) | Enabled |

**Locale and Namespace Parameters:**

| | |
|---|---|
| CODE_PAGE (Code page on target) | **Cyrillic (Windows) *** |
| USE_LFN (Use Long Filename) | Disabled |
| MAX_LFN (Max Long Filename) | 255 |
| LFN_UNICODE (Enable Unicode) | ANSI/OEM |
| STRF_ENCODE (Character encoding) | UTF-8 |
| FS_RPATH (Relative Path) | Disabled |

**Physical Drive Parameters:**

| | |
|---|---|
| VOLUMES (Logical drives) | 1 |
| MAX_SS (Maximum Sector Size) | 512 |
| MIN_SS (Minimum Sector Size) | 512 |
| MULTI_PARTITION (Volume partitions feature) | Disabled |
| USE_TRIM (Erase feature) | Disabled |
| FS_NOFSINFO (Force full FAT scan) | 0 |

**System Parameters:**

| | |
|---|---|
| FS_NORTC (Timestamp feature) | Dynamic timestamp |
| NORTC_YEAR (Year for timestamp) | 2015 |
| NORTC_MON (Month for timestamp) | 6 |
| NORTC_MDAY (Day for timestamp) | 4 |
| WORD_ACCESS (Platform dependent access option) | Byte access |
| FS_REENTRANT (Re-Entrancy) | Disabled |
| FS_TIMEOUT (Timeout ticks) | 1000 |
| SYNC_t (O/S sync object) | osSemaphoreId |
| FS_LOCK (Number of files opened simultaneously) | 2 |

## 5.6.2. IPs instances:

**SDIO/SDMMC:**

| | |
|---|---|
| SDIO instance | SDIO |

*** User modified value**

# 6. System Configuration

## 6.1. GPIO configuration

| IP | Pin | Signal | GPIO mode | GPIO pull/up pull down | Max Speed | User Label |
|---|---|---|---|---|---|---|
| I2S2 | PC3 | I2S2_SD | Alternate Function Push Pull | No pull-up and no pull-down | Low | |
| | PB10 | I2S2_CK | Alternate Function Push Pull | No pull-up and no pull-down | Low | |
| | PB12 | I2S2_WS | Alternate Function Push Pull | No pull-up and no pull-down | Low | |
| 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 | |
| | PA8 | RCC_MCO_1 | Alternate Function Push Pull | No pull-up and no pull-down | Low | |
| SDIO | PC8 | SDIO_D0 | Alternate Function Push Pull | **Pull-up *** | Very High | |
| | PC12 | SDIO_CK | Alternate Function Push Pull | No pull-up and no pull-down | Very High | |
| | PD2 | SDIO_CMD | Alternate Function Push Pull | **Pull-up *** | Very High | |
| USART1 | PA9 | USART1_TX | Alternate Function Push Pull | Pull-up | **Very High *** | |
| | PA10 | USART1_RX | Alternate Function Push Pull | Pull-up | **Very High *** | |
| GPIO | PE1 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | |

## 6.2. DMA configuration

| DMA request | Stream | Direction | Priority |
|---|---|---|---|
| SPI2_TX | DMA1_Stream4 | Memory To Peripheral | Low |

*SPI2_TX: DMA1_Stream4 DMA request Settings:*

| | |
|---|---|
| Mode: | **Circular *** |
| Use fifo: | Disable |
| Peripheral Increment: | Disable |
| Memory Increment: | **Enable *** |
| Peripheral Data Width: | **Half Word *** |
| Memory Data Width: | **Half Word *** |

## 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 | 0 | 0 |
| System tick timer | true | 0 | 0 |
| DMA1 stream4 global interrupt | true | 0 | 0 |
| PVD interrupt through EXTI line 16 | unused | | |
| Flash global interrupt | unused | | |
| RCC global interrupt | unused | | |
| SPI2 global interrupt | unused | | |
| USART1 global interrupt | unused | | |
| SDIO global interrupt | unused | | |
| FPU global interrupt | unused | | |

*** User modified value**

# 7. Power Consumption Calculator report

## 7.1. Microcontroller Selection

| | |
|---|---|
| Series | STM32F4 |
| Line | STM32F427/437 |
| MCU | STM32F437VGTx |
| Datasheet | 024244_Rev9 |

## 7.2. Parameter Selection

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

# 8. Software Project

## 8.1. Project Settings

| Name | Value |
|---|---|
| Project Name | mp3_stm32 |
| Project Folder | /home/lyra/b/mp3_stm32 |
| Toolchain / IDE | SW4STM32 |
| Firmware Package Name and Version | STM32Cube FW_F4 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 | Yes |
| Backup previously generated files 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 |