



## 1. Description

### 1.1. Project

Project Name	BootLoader
Board Name	custom
Generated with:	STM32CubeMX 6.2.1
Date	04/13/2021

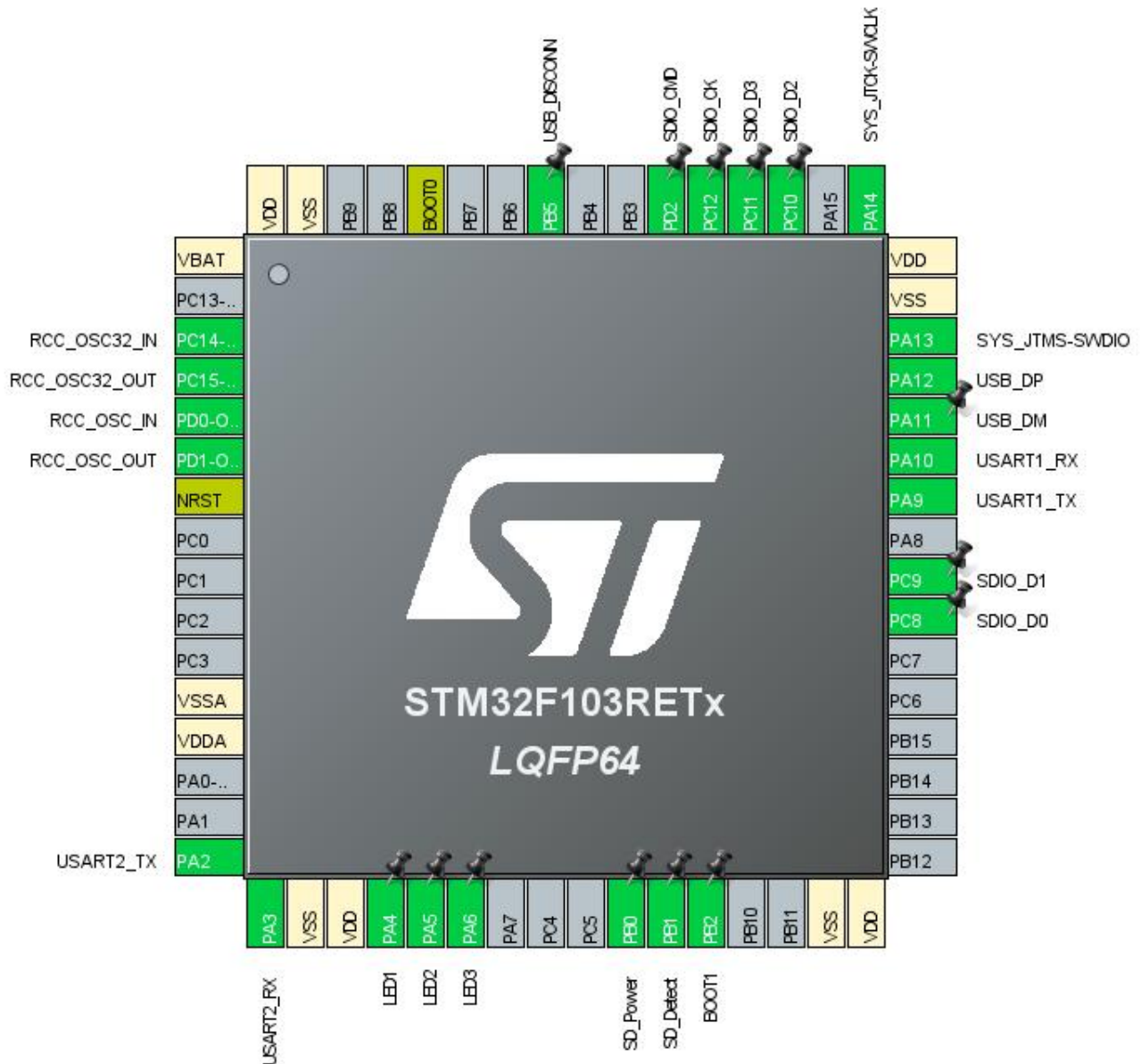
### 1.2. MCU

MCU Series	STM32F1
MCU Line	STM32F103
MCU name	STM32F103RETx
MCU Package	LQFP64
MCU Pin number	64

### 1.3. Core(s) information

Core(s)	Arm Cortex-M3
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## 2. Pinout Configuration



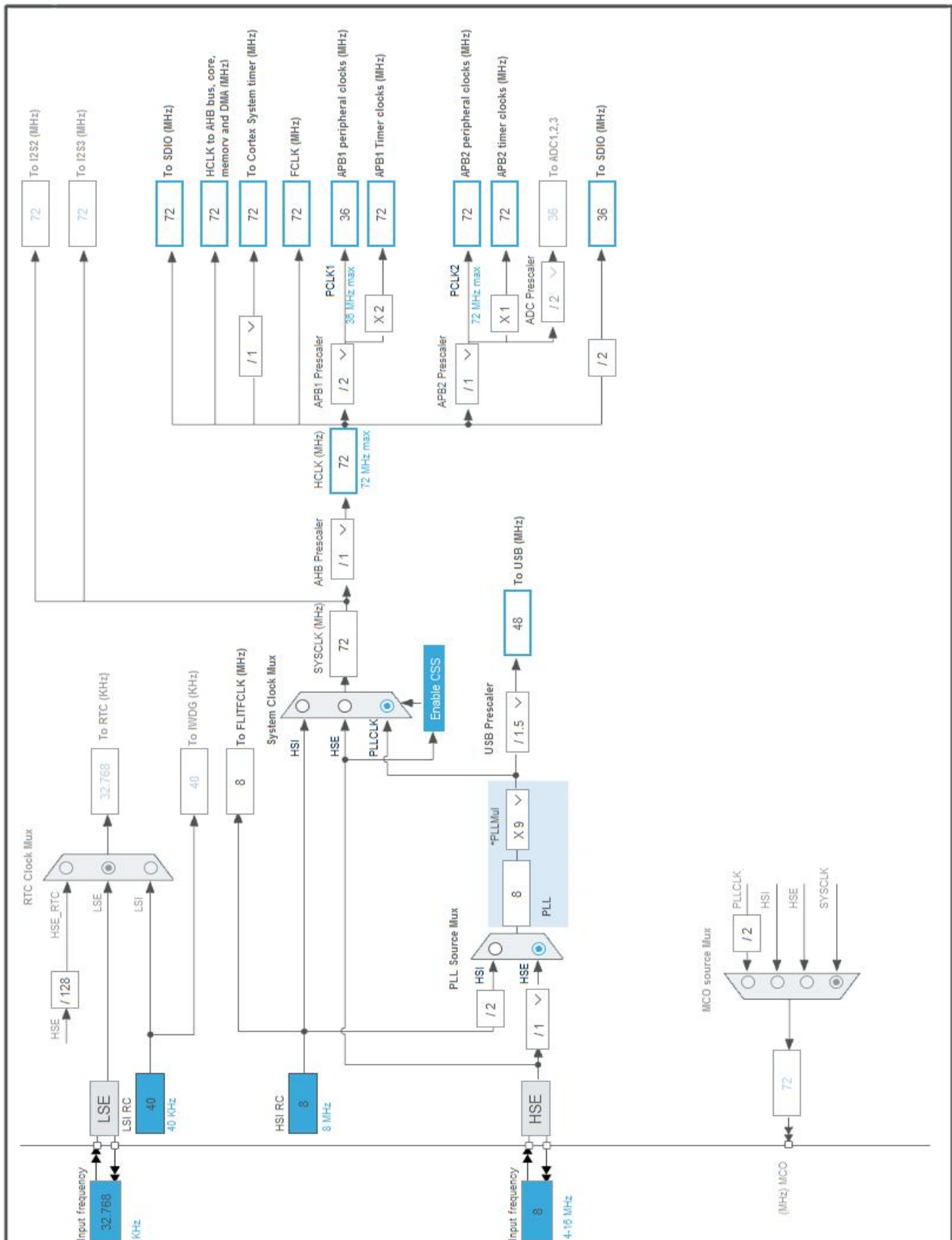
### 3. Pins Configuration

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
3	PC14-OSC32_IN	I/O	RCC_OSC32_IN	
4	PC15-OSC32_OUT	I/O	RCC_OSC32_OUT	
5	PD0-OSC_IN	I/O	RCC_OSC_IN	
6	PD1-OSC_OUT	I/O	RCC_OSC_OUT	
7	NRST	Reset		
12	VSSA	Power		
13	VDDA	Power		
16	PA2	I/O	USART2_TX	
17	PA3	I/O	USART2_RX	
18	VSS	Power		
19	VDD	Power		
20	PA4 *	I/O	GPIO_Output	LED1
21	PA5 *	I/O	GPIO_Output	LED2
22	PA6 *	I/O	GPIO_Output	LED3
26	PB0 *	I/O	GPIO_Output	SD_Power
27	PB1 *	I/O	GPIO_Input	SD_Detect
28	PB2 *	I/O	GPIO_Input	BOOT1
31	VSS	Power		
32	VDD	Power		
39	PC8	I/O	SDIO_D0	
40	PC9	I/O	SDIO_D1	
42	PA9	I/O	USART1_TX	
43	PA10	I/O	USART1_RX	
44	PA11	I/O	USB_DM	
45	PA12	I/O	USB_DP	
46	PA13	I/O	SYS_JTMS-SWDIO	
47	VSS	Power		
48	VDD	Power		
49	PA14	I/O	SYS_JTCK-SWCLK	
51	PC10	I/O	SDIO_D2	
52	PC11	I/O	SDIO_D3	
53	PC12	I/O	SDIO_CK	
54	PD2	I/O	SDIO_CMD	
57	PB5 *	I/O	GPIO_Output	USB_DISCONN
60	BOOT0	Boot		

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
63	VSS	Power		
64	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	BootLoader
Project Folder	C:\EmbeddedTest\DFU\BootLoader
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_F1 V1.8.3
Application Structure	Advanced
Generate Under Root	Yes
Do not generate the main()	No
Minimum Heap Size	0x1000
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
3	MX_SDIO_SD_Init	SDIO
4	MX_USB_DEVICE_Init	USB_DEVICE
5	MX_USART1_UART_Init	USART1
6	MX_USART2_UART_Init	USART2
7	MX_CRC_Init	CRC
8	MX_TIM6_Init	TIM6

## 6. Power Consumption Calculator report

### 6.1. Microcontroller Selection

Series	STM32F1
Line	STM32F103
MCU	STM32F103RETx
Datasheet	DS5792_Rev12

### 6.2. Parameter Selection

Temperature	25
Vdd	3.3

### 6.3. Battery Selection

Battery	Li-SOCL2(A3400)
Capacity	3400.0 mAh
Self Discharge	0.08 %/month
Nominal Voltage	3.6 V
Max Cont Current	100.0 mA
Max Pulse Current	200.0 mA
Cells in series	1
Cells in parallel	1



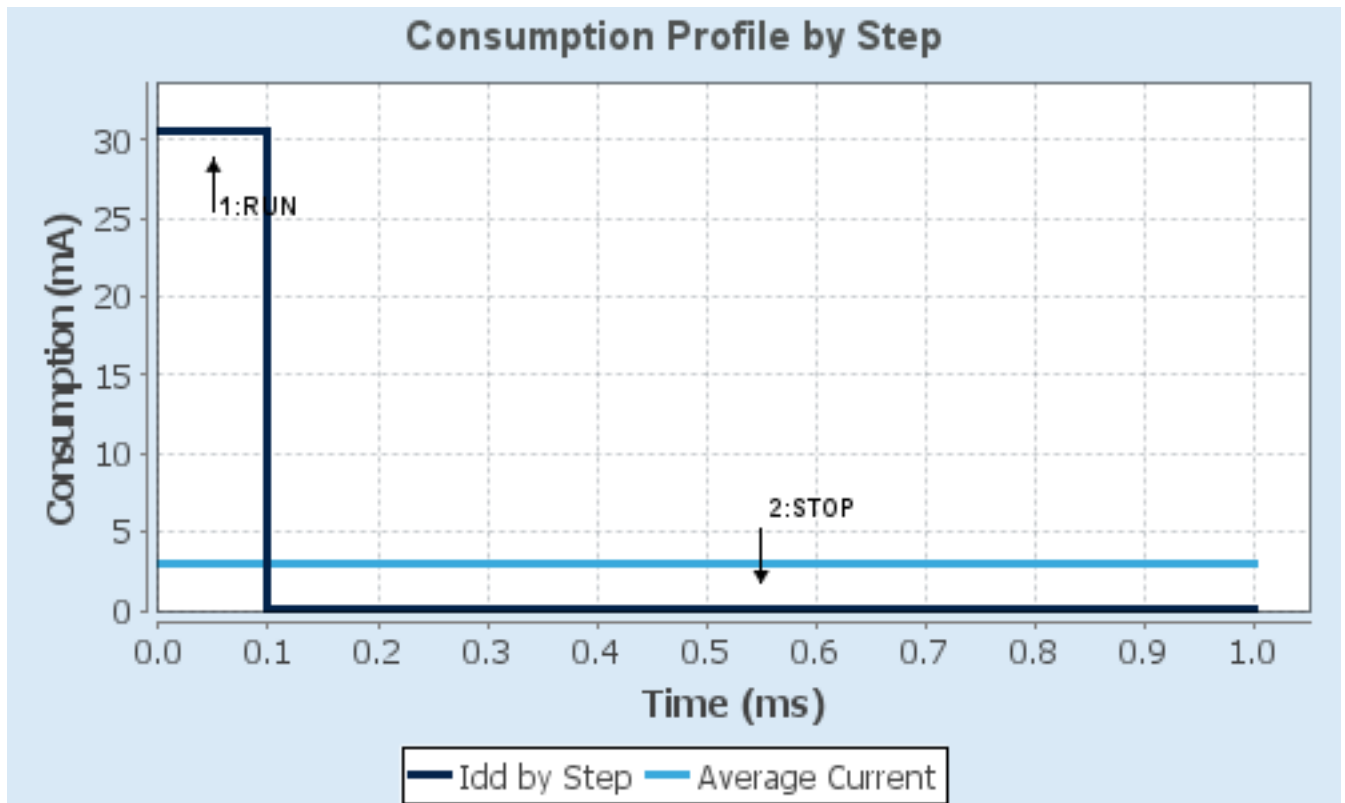
#### 6.4. Sequence

<b>Step</b>	Step1	Step2
<b>Mode</b>	RUN	STOP
<b>Vdd</b>	3.3	3.3
<b>Voltage Source</b>	Battery	Battery
<b>Range</b>	No Scale	No Scale
<b>Fetch Type</b>	FLASH	n/a
<b>CPU Frequency</b>	72 MHz	0 Hz
<b>Clock Configuration</b>	HSE PLL	Regulator LP
<b>Clock Source Frequency</b>	8 MHz	0 Hz
<b>Peripherals</b>		
<b>Additional Cons.</b>	0 mA	0 mA
<b>Average Current</b>	30.5 mA	25 $\mu$ A
<b>Duration</b>	0.1 ms	0.9 ms
<b>DMIPS</b>	90.0	0.0
<b>Ta Max</b>	100.47	105
<b>Category</b>	In DS Table	In DS Table

#### 6.5. Results

Sequence Time	1 ms	Average Current	3.07 mA
Battery Life	1 month, 15 days, 15 hours	Average DMIPS	61.0 DMIPS

#### 6.6. Chart



## 7. Peripherals and Middlewares Configuration

### 7.1. CRC

mode: Activated

### 7.2. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

Low Speed Clock (LSE) : Crystal/Ceramic Resonator

#### 7.2.1. Parameter Settings:

##### System Parameters:

VDD voltage (V)	3.3
Prefetch Buffer	Enabled
Flash Latency(WS)	2 WS (3 CPU cycle)

##### RCC Parameters:

HSI Calibration Value	16
HSE Startup Timeout Value (ms)	100
LSE Startup Timeout Value (ms)	5000

### 7.3. SDIO

Mode: SD 4 bits Wide bus

#### 7.3.1. Parameter Settings:

##### SDIO parameters:

Clock transition on which the bit capture is made	Rising transition
SDIO Clock divider bypass	Disable
SDIO Clock output enable when the bus is idle	Disable the power save for the clock
SDIO hardware flow control	The hardware control flow is disabled
SDIOCLK clock divide factor	0

### 7.4. SYS

Debug: Serial Wire

Timebase Source: SysTick

### 7.5. TIM6

**mode: Activated**

**7.5.1. Parameter Settings:**

**Counter Settings:**

Prescaler (PSC - 16 bits value)	<b>9999 *</b>
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value )	<b>3599 *</b>
auto-reload preload	<b>Enable *</b>

**Trigger Output (TRGO) Parameters:**

Trigger Event Selection	Reset (UG bit from TIMx_EGR)
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**7.6. USART1**

**Mode: Asynchronous**

**7.6.1. Parameter Settings:**

**Basic Parameters:**

Baud Rate	<b>38400 *</b>
Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1

**Advanced Parameters:**

Data Direction	Receive and Transmit
Over Sampling	16 Samples

**7.7. USART2**

**Mode: Asynchronous**

**7.7.1. Parameter Settings:**

**Basic Parameters:**

Baud Rate	<b>38400 *</b>
Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1

**Advanced Parameters:**

Data Direction	Receive and Transmit
Over Sampling	16 Samples

## 7.8. USB

### mode: Device (FS)

#### 7.8.1. Parameter Settings:

##### Basic Parameters:

Speed Full Speed 12MBit/s

##### Power Parameters:

Low Power Disabled

Link Power Management Disabled

Battery Charging Disabled

## 7.9. USB\_DEVICE

### Class For FS IP: Download Firmware Update Class (DFU)

#### 7.9.1. Parameter Settings:

##### Basic Parameters:

USBD_MAX_NUM_INTERFACES (Maximum number of supported interfaces)	1
USBD_MAX_NUM_CONFIGURATION (Maximum number of supported configuration)	1
USBD_MAX_STR_DESC_SIZ (Maximum size for the string descriptors)	512
USBD_SUPPORT_USER_STRING_DESC (Enable user string descriptor)	Enabled
USBD_SELF_POWERED (Enabled self power)	Enabled
USBD_DEBUG_LEVEL (USBD Debug Level)	0: No debug message

##### Class Parameters:

USBD_DFU_MAX_ITF_NUM (DFU maximum interface numbers)	1
USBD_DFU_XFER_SIZE	<b>2048 *</b>
USBD_DFU_APP_DEFAULT_ADD (Base Address 0x)	<b>0x0800C000 *</b>
USBD_DFU_MEDIA Interface	@ Internal Flash /0x08000000/03*016Ka,01*016Kg,01*064Kg,07*128Kg,04*016Kg,01*064Kg,07*1

#### 7.9.2. Device Descriptor:

##### Device Descriptor:

VID (Vendor Identifier)	1155
LANGID_STRING (Language Identifier)	English(United States)
MANUFACTURER_STRING (Manufacturer Identifier)	STMicroelectronics

**Device Descriptor FS:**

PID (Product Identifier)	57105
PRODUCT_STRING (Product Identifier)	STM32 DownLoad Firmware Update
CONFIGURATION_STRING (Configuration Identifier)	DFU Config
INTERFACE_STRING (Interface Identifier)	DFU Interface

\* 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	
	PD0-OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	
	PD1-OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	
SDIO	PC8	SDIO_D0	Alternate Function Push Pull	n/a	High	
	PC9	SDIO_D1	Alternate Function Push Pull	n/a	High	
	PC10	SDIO_D2	Alternate Function Push Pull	n/a	High	
	PC11	SDIO_D3	Alternate Function Push Pull	n/a	High	
	PC12	SDIO_CK	Alternate Function Push Pull	n/a	High	
	PD2	SDIO_CMD	Alternate Function Push Pull	n/a	High	
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
USART1	PA9	USART1_TX	Alternate Function Push Pull	n/a	High *	
	PA10	USART1_RX	Input mode	No pull-up and no pull-down	n/a	
USART2	PA2	USART2_TX	Alternate Function Push Pull	n/a	High *	
	PA3	USART2_RX	Input mode	No pull-up and no pull-down	n/a	
USB	PA11	USB_DM	n/a	n/a	n/a	
	PA12	USB_DP	n/a	n/a	n/a	
GPIO	PA4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED1
	PA5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED2
	PA6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED3
	PB0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SD_Power
	PB1	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	SD_Detect
	PB2	GPIO_Input	Input mode	Pull-up *	n/a	BOOT1
	PB5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	USB_DISCONN

### 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
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	0	0
System tick timer	true	0	0
USB low priority or CAN RX0 interrupts	true	0	0
USART1 global interrupt	true	0	0
USART2 global interrupt	true	0	0
TIM6 global interrupt	true	0	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
USB high priority or CAN TX interrupts	unused		
SDIO 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
Prefetch fault, memory access fault	false	true	false
Undefined instruction or illegal state	false	true	false
System service call via SWI instruction	false	true	false
Debug monitor	false	true	false
Pendable request for system service	false	true	false
System tick timer	false	true	true
USB low priority or CAN RX0 interrupts	false	true	true
USART1 global interrupt	false	true	true
USART2 global interrupt	false	true	true
TIM6 global interrupt	false	true	true

**\* User modified value**

## 9. System Views

### 9.1. Category view

#### 9.1.1. Current

## 10. Docs & Resources

Type	Link
Datasheet	<a href="http://www.st.com/resource/en/datasheet/CD00191185.pdf">http://www.st.com/resource/en/datasheet/CD00191185.pdf</a>
Reference manual	<a href="http://www.st.com/resource/en/reference_manual/CD00171190.pdf">http://www.st.com/resource/en/reference_manual/CD00171190.pdf</a>
Programming manual	<a href="http://www.st.com/resource/en/programming_manual/CD00228163.pdf">http://www.st.com/resource/en/programming_manual/CD00228163.pdf</a>
Programming manual	<a href="http://www.st.com/resource/en/programming_manual/CD00283419.pdf">http://www.st.com/resource/en/programming_manual/CD00283419.pdf</a>
Errata sheet	<a href="http://www.st.com/resource/en/errata_sheet/CD00197763.pdf">http://www.st.com/resource/en/errata_sheet/CD00197763.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/CD00160362.pdf">http://www.st.com/resource/en/application_note/CD00160362.pdf</a>
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Application note	<a href="http://www.st.com/resource/en/application_note/CD00200423.pdf">http://www.st.com/resource/en/application_note/CD00200423.pdf</a>
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