

1. Description

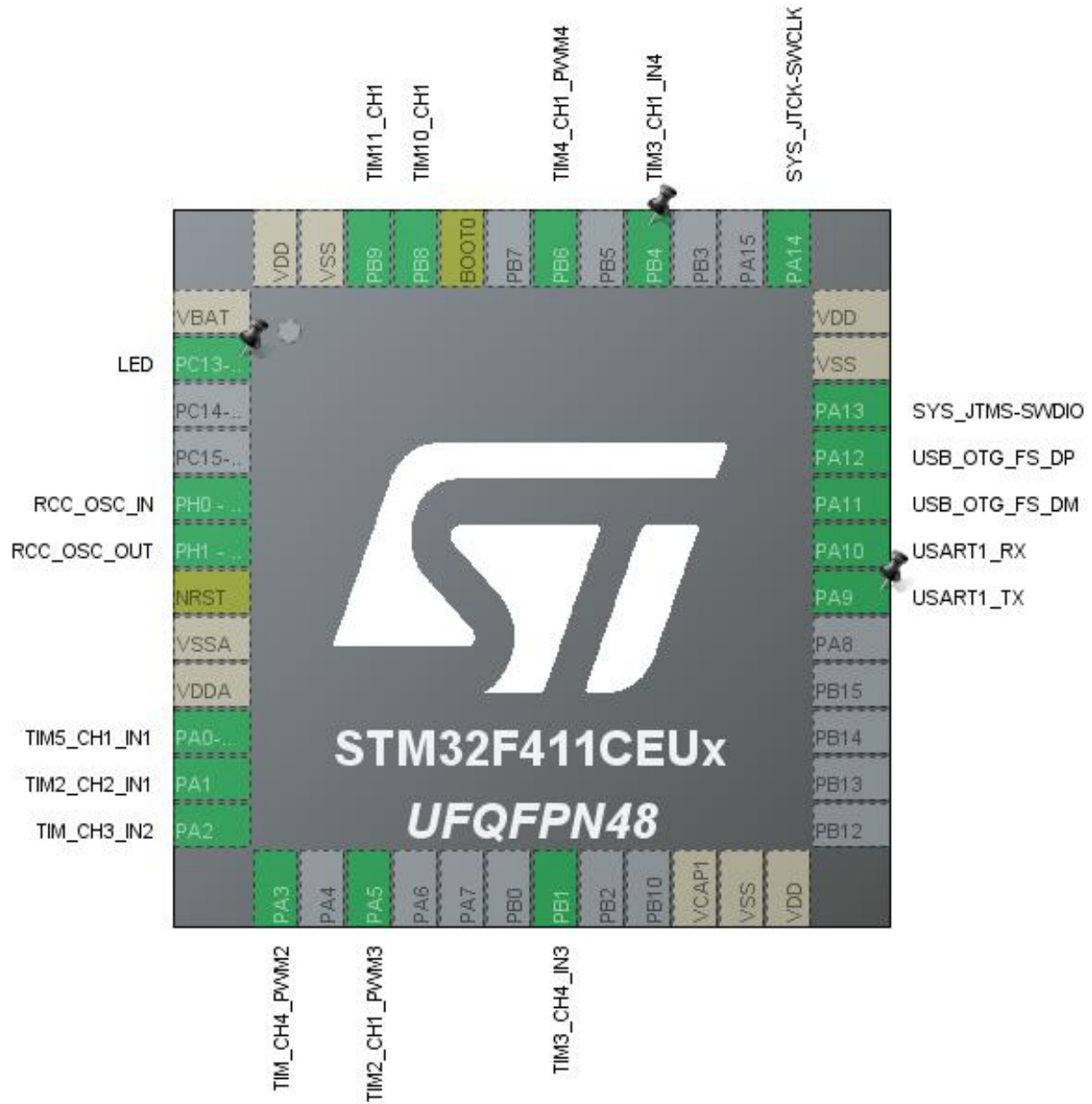
1.1. Project

Project Name	stm32f411-MISCEA
Board Name	custom
Generated with:	STM32CubeMX 5.6.1
Date	07/27/2020

1.2. MCU

MCU Series	STM32F4
MCU Line	STM32F411
MCU name	STM32F411CEUx
MCU Package	UFQFPN48
MCU Pin number	48

2. Pinout Configuration

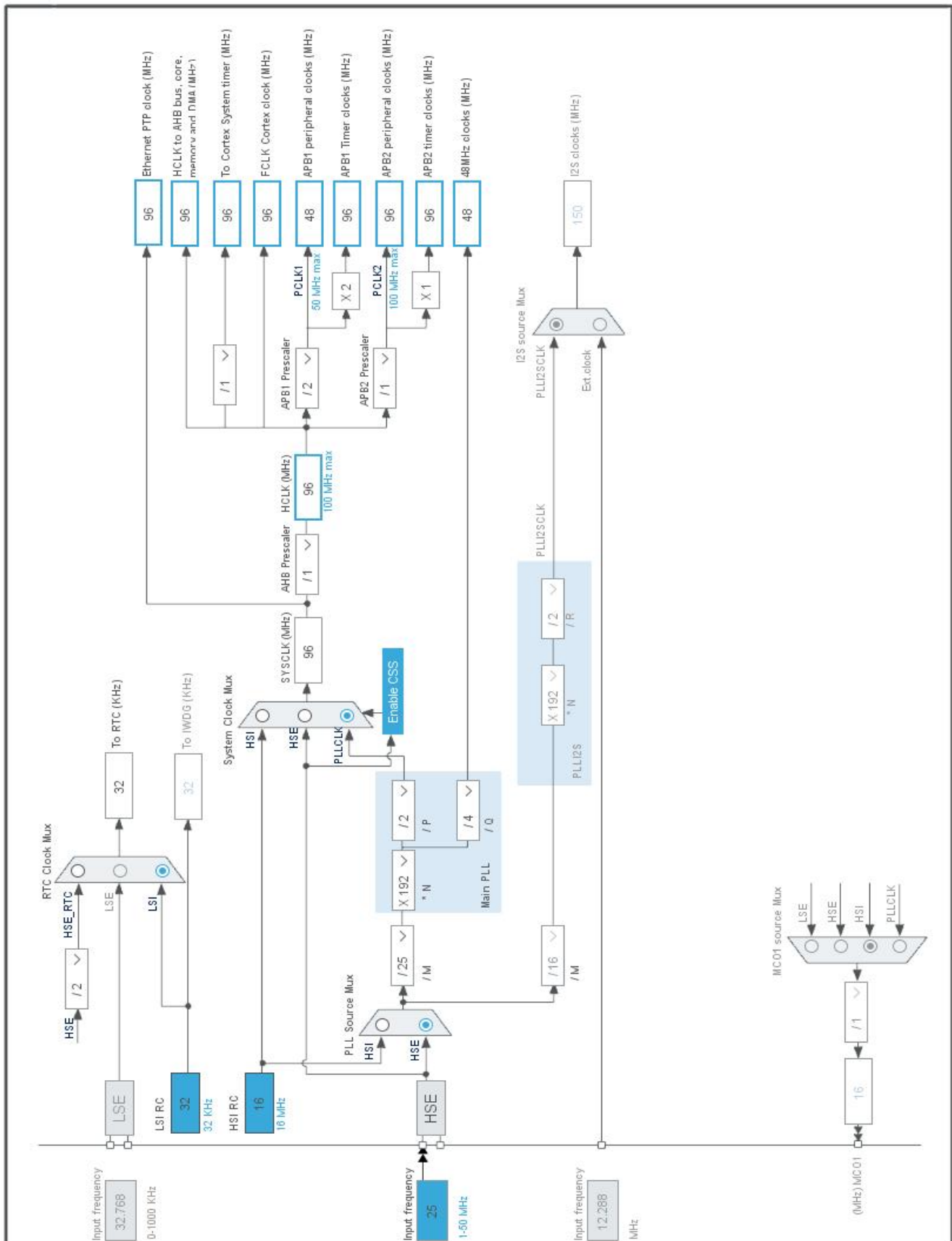


3. Pins Configuration

Pin Number UFQFPN48	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
2	PC13-ANTI_TAMP *	I/O	GPIO_Output	LED
5	PH0 - OSC_IN	I/O	RCC_OSC_IN	
6	PH1 - OSC_OUT	I/O	RCC_OSC_OUT	
7	NRST	Reset		
8	VSSA	Power		
9	VDDA	Power		
10	PA0-WKUP	I/O	TIM5_CH1	TIM5_CH1_IN1
11	PA1	I/O	TIM2_CH2	TIM2_CH2_IN1
12	PA2	I/O	TIM5_CH3	TIM_CH3_IN2
13	PA3	I/O	TIM2_CH4	TIM_CH4_PWM2
15	PA5	I/O	TIM2_CH1	TIM2_CH1_PWM3
19	PB1	I/O	TIM3_CH4	TIM3_CH4_IN3
22	VCAP1	Power		
23	VSS	Power		
24	VDD	Power		
30	PA9	I/O	USART1_TX	
31	PA10	I/O	USART1_RX	
32	PA11	I/O	USB_OTG_FS_DM	
33	PA12	I/O	USB_OTG_FS_DP	
34	PA13	I/O	SYS_JTMS-SWDIO	
35	VSS	Power		
36	VDD	Power		
37	PA14	I/O	SYS_JTCK-SWCLK	
40	PB4	I/O	TIM3_CH1	TIM3_CH1_IN4
42	PB6	I/O	TIM4_CH1	TIM4_CH1_PWM4
44	BOOT0	Boot		
45	PB8	I/O	TIM10_CH1	
46	PB9	I/O	TIM11_CH1	
47	VSS	Power		
48	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	stm32f411-MISCEA
Project Folder	H:\MISCEA\stm32f411-MISCEA
Toolchain / IDE	MDK-ARM V5.27
Firmware Package Name and Version	STM32Cube FW_F4 V1.25.0

5.2. Code Generation Settings

Name	Value
STM32Cube MCU packages and embedded software	Copy all used libraries into the project folder
Generate peripheral initialization as a pair of '.c/.h' files	Yes
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	STM32F411
MCU	STM32F411CEUx
Datasheet	026289_Rev6

6.2. Parameter Selection

Temperature	25
Vdd	3.6

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

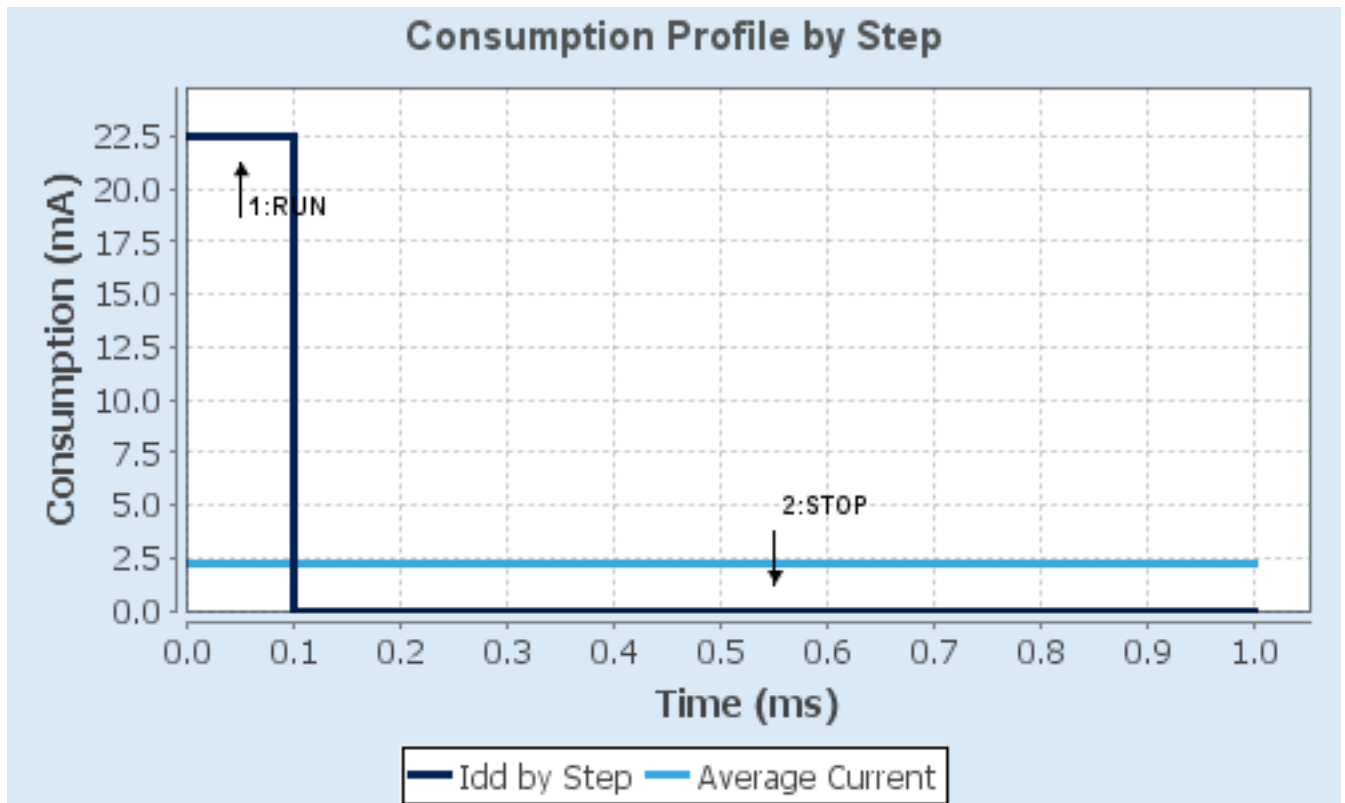
6.4. Sequence

Step	Step1	Step2
Mode	RUN	STOP
Vdd	3.6	3.6
Voltage Source	Battery	Battery
Range	Scale1-High	No Scale
Fetch Type	FLASH/ART/PREFETCH	n/a
CPU Frequency	100 MHz	0 Hz
Clock Configuration	HSE PLL	Regulator_LPLV Flash-PwrDwn
Clock Source Frequency	4 MHz	0 Hz
Peripherals		
Additional Cons.	0 mA	0 mA
Average Current	22.5 mA	10 μ A
Duration	0.1 ms	0.9 ms
DMIPS	125.0	0.0
Ta Max	102.41	105
Category	In DS Table	In DS Table

6.5. RESULTS

Sequence Time	1 ms	Average Current	2.26 mA
Battery Life	2 months, 1 day, 18 hours	Average DMIPS	125.0 DMIPS

6.6. Chart



7. IPs and Middleware Configuration

7.1. GPIO

7.2. RCC

High Speed Clock (HSE): BYPASS Clock Source

7.2.1. 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 Timeout Value (ms)	100
LSE Startup Timeout Value (ms)	5000

Power Parameters:

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

7.3. SYS

Debug: Serial Wire

Timebase Source: SysTick

7.4. TIM2

Channel1: PWM Generation CH1

Channel2: PWM Generation CH2

Channel4: PWM Generation CH4

7.4.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 32 bits value)	0
Internal Clock Division (CKD)	No Division

auto-reload preload Disable

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit) Disable (Trigger input effect not delayed)
Trigger Event Selection Reset (UG bit from TIMx_EGR)

PWM Generation Channel 1:

Mode PWM mode 1
Pulse (32 bits value) 0
Output compare preload Enable
Fast Mode Disable
CH Polarity High

PWM Generation Channel 2:

Mode PWM mode 1
Pulse (32 bits value) 0
Output compare preload Enable
Fast Mode Disable
CH Polarity High

PWM Generation Channel 4:

Mode PWM mode 1
Pulse (32 bits value) 0
Output compare preload Enable
Fast Mode Disable
CH Polarity High

7.5. TIM3

Channel1: Input Capture direct mode

Channel4: Input Capture direct mode

7.5.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value) 0
Counter Mode Up
Counter Period (AutoReload Register - 16 bits value) 0
Internal Clock Division (CKD) No Division
auto-reload preload Disable

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit) Disable (Trigger input effect not delayed)
Trigger Event Selection Reset (UG bit from TIMx_EGR)

Input Capture Channel 1:

Polarity Selection Rising Edge

IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter (4 bits value)	0

Input Capture Channel 4:

Polarity Selection	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter (4 bits value)	0

7.6. TIM4

Channel1: PWM Generation CH1

7.6.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	0
Internal Clock Division (CKD)	No Division
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit)	Disable (Trigger input effect not delayed)
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

PWM Generation Channel 1:

Mode	PWM mode 1
Pulse (16 bits value)	0
Output compare preload	Enable
Fast Mode	Disable
CH Polarity	High

7.7. TIM5

mode: Clock Source

Channel1: Input Capture direct mode

Channel3: Input Capture direct mode

7.7.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	2 *
---------------------------------	-----

Counter Mode	Up
Counter Period (AutoReload Register - 32 bits value)	0
Internal Clock Division (CKD)	No Division
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit)	Disable (Trigger input effect not delayed)
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

Input Capture Channel 1:

Polarity Selection	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter (4 bits value)	0

Input Capture Channel 3:

Polarity Selection	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter (4 bits value)	0

7.8. TIM10

mode: Activated

Channel1: PWM Generation CH1

7.8.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	0
Internal Clock Division (CKD)	No Division
auto-reload preload	Disable

PWM Generation Channel 1:

Mode	PWM mode 1
Pulse (16 bits value)	0
Output compare preload	Enable
Fast Mode	Disable
CH Polarity	High

7.9. TIM11

mode: Activated

Channel1: Input Capture direct mode

7.9.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	0
Internal Clock Division (CKD)	No Division
auto-reload preload	Disable

Input Capture Channel 1:

Polarity Selection	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter (4 bits value)	0

7.10. USART1

Mode: Asynchronous

7.10.1. 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

7.11. USB_OTG_FS

Mode: Device_Only

7.11.1. Parameter Settings:

Speed	Device Full Speed 12MBit/s
Low power	Disabled

Link Power Management	Disabled
VBUS sensing	Disabled
Signal start of frame	Disabled

7.12. USB_DEVICE

Class For FS IP: Communication Device Class (Virtual Port Com)

7.12.1. 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_SELF_POWERED (Enabled self power)	Enabled
USBD_DEBUG_LEVEL (USBD Debug Level)	0: No debug message

Class Parameters:

USB CDC Rx Buffer Size	2048
USB CDC Tx Buffer Size	2048

7.12.2. 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)	22336
PRODUCT_STRING (Product Identifier)	STM32 Virtual ComPort
CONFIGURATION_STRING (Configuration Identifier)	CDC Config
INTERFACE_STRING (Interface Identifier)	CDC 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	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	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
TIM2	PA1	TIM2_CH2	Alternate Function Push Pull	No pull-up and no pull-down	Low	TIM2_CH2_IN1
	PA3	TIM2_CH4	Alternate Function Push Pull	No pull-up and no pull-down	Low	TIM_CH4_PWM2
	PA5	TIM2_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	TIM2_CH1_PWM3
TIM3	PB1	TIM3_CH4	Alternate Function Push Pull	No pull-up and no pull-down	Low	TIM3_CH4_IN3
	PB4	TIM3_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	TIM3_CH1_IN4
TIM4	PB6	TIM4_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	TIM4_CH1_PWM4
TIM5	PA0-WKUP	TIM5_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	TIM5_CH1_IN1
	PA2	TIM5_CH3	Alternate Function Push Pull	No pull-up and no pull-down	Low	TIM_CH3_IN2
TIM10	PB8	TIM10_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	
TIM11	PB9	TIM11_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	
USART1	PA9	USART1_TX	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PA10	USART1_RX	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
USB_OTG_FS	PA11	USB_OTG_FS_DM	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PA12	USB_OTG_FS_DP	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
GPIO	PC13-ANTI_TAMP	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	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
USB On The Go FS global interrupt	true	0	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
TIM1 update interrupt and TIM10 global interrupt	unused		
TIM1 trigger and commutation interrupts and TIM11 global interrupt	unused		
TIM2 global interrupt	unused		
TIM3 global interrupt	unused		
TIM4 global interrupt	unused		
USART1 global interrupt	unused		
TIM5 global interrupt	unused		
FPU global interrupt	unused		

* User modified value

9. Predefined Views - Category view : Current

Middleware

USB_DEVICE ✓

System Core

DMA

GPIO ✓

NVIC ✓

RCC ✓

SYS ✓

Analog

Timers

TIM2 ✓

TIM3 ✓

TIM4 ✓

TIM5 ✓

TIM10 ✓

TIM11 ✓

Connectivity

USART1 ✓

USB_FS ✓

Multimedia

Computing

10. Software Pack Report