1. Description

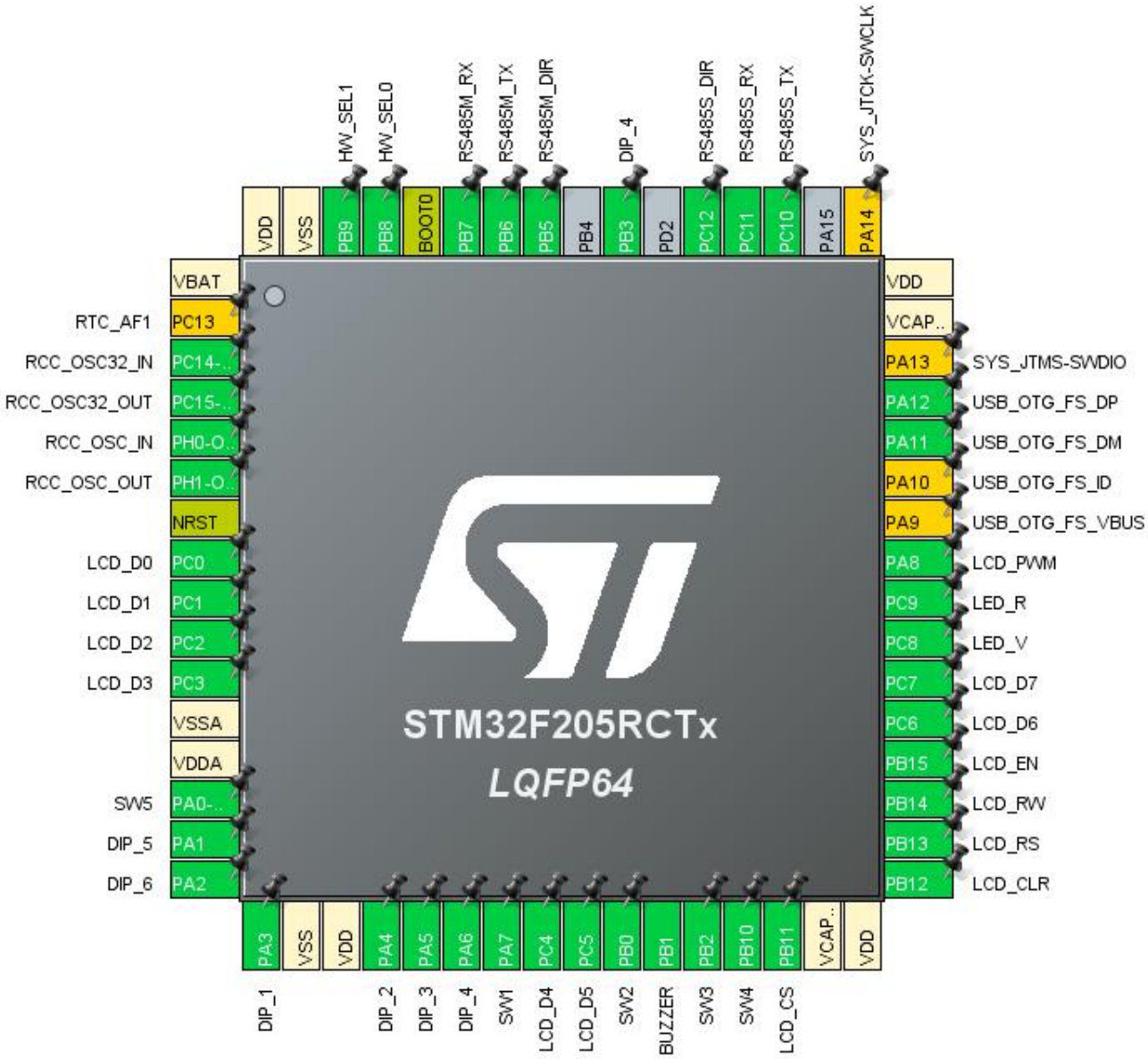
1.1. Project

Project Name	FW00054
Board Name	custom
Generated with:	STM32CubeMX 5.6.1
Date	11/12/2020

1.2. MCU

MCU Series	STM32F2
MCU Line	STM32F2x5
MCU name	STM32F205RCTx
MCU Package	LQFP64
MCU Pin number	64

2. Pinout Configuration



3. Pins Configuration

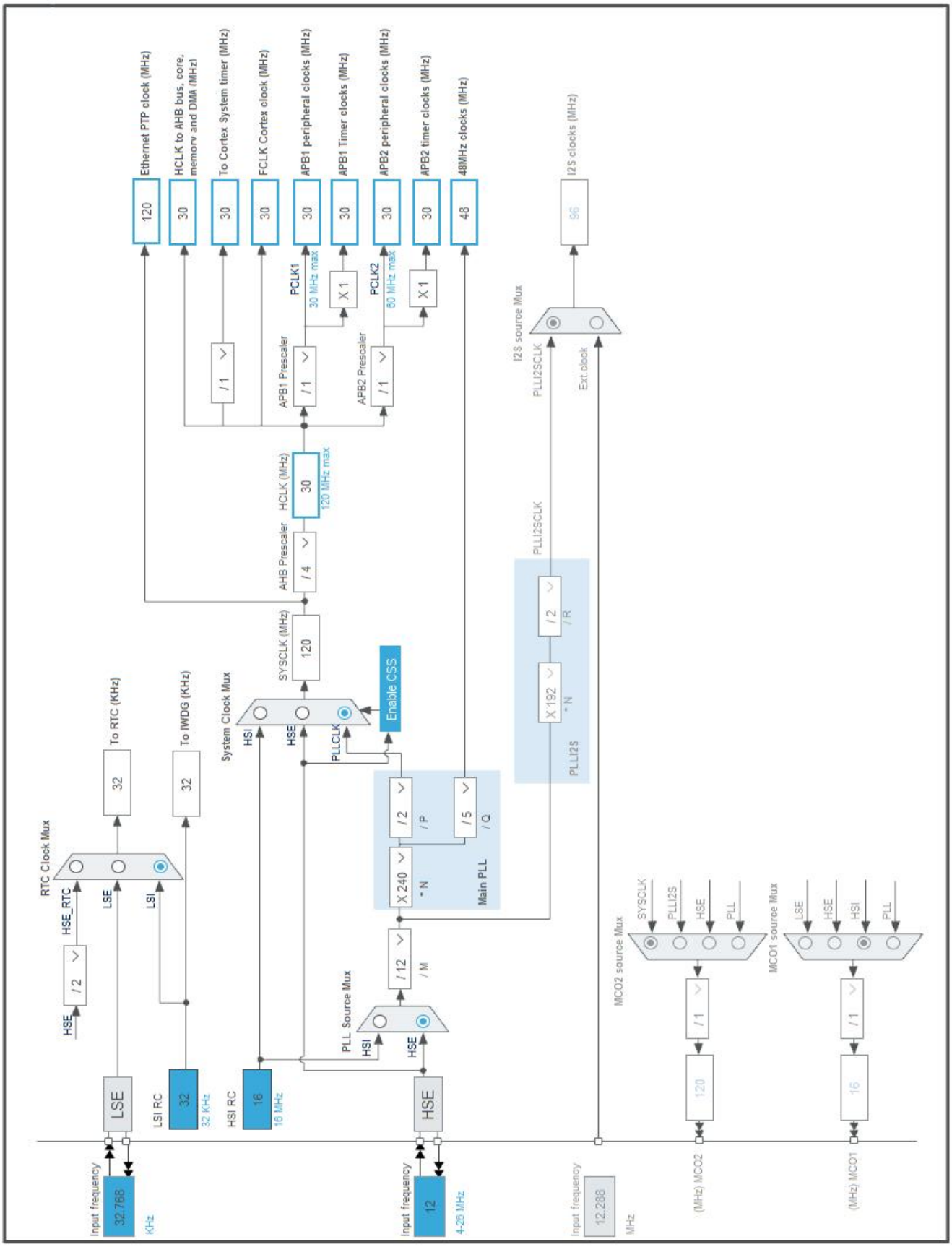
Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
2	PC13 *	I/O	RTC_AF1	
3	PC14-OSC32_IN	I/O	RCC_OSC32_IN	
4	PC15-OSC32_OUT	I/O	RCC_OSC32_OUT	
5	PH0-OSC_IN	I/O	RCC_OSC_IN	
6	PH1-OSC_OUT	I/O	RCC_OSC_OUT	
7	NRST	Reset		
8	PC0 **	I/O	GPIO_Output	LCD_D0
9	PC1 **	I/O	GPIO_Output	LCD_D1
10	PC2 **	I/O	GPIO_Output	LCD_D2
11	PC3 **	I/O	GPIO_Output	LCD_D3
12	VSSA	Power		
13	VDDA	Power		
14	PA0-WKUP **	I/O	GPIO_Input	SW5
15	PA1 **	I/O	GPIO_Input	DIP_5
16	PA2 **	I/O	GPIO_Input	DIP_6
17	PA3 **	I/O	GPIO_Input	DIP_1
18	VSS	Power		
19	VDD	Power		
20	PA4 **	I/O	GPIO_Input	DIP_2
21	PA5 **	I/O	GPIO_Input	DIP_3
22	PA6 **	I/O	GPIO_Input	DIP_4
23	PA7 **	I/O	GPIO_Input	SW1
24	PC4 **	I/O	GPIO_Output	LCD_D4
25	PC5 **	I/O	GPIO_Output	LCD_D5
26	PB0 **	I/O	GPIO_Input	SW2
27	PB1	I/O	TIM3_CH4	BUZZER
28	PB2 **	I/O	GPIO_Input	SW3
29	PB10 **	I/O	GPIO_Input	SW4
30	PB11 **	I/O	GPIO_Output	LCD_CS
31	VCAP_1	Power		
32	VDD	Power		
33	PB12 **	I/O	GPIO_Output	LCD_CLR
34	PB13 **	I/O	GPIO_Output	LCD_RS
35	PB14 **	I/O	GPIO_Output	LCD_RW
36	PB15 **	I/O	GPIO_Output	LCD_EN

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
37	PC6 **	I/O	GPIO_Output	LCD_D6
38	PC7 **	I/O	GPIO_Output	LCD_D7
39	PC8 **	I/O	GPIO_Output	LED_V
40	PC9 **	I/O	GPIO_Output	LED_R
41	PA8	I/O	TIM1_CH1	LCD_PWM
42	PA9 *	I/O	USB_OTG_FS_VBUS	
43	PA10 *	I/O	USB_OTG_FS_ID	
44	PA11	I/O	USB_OTG_FS_DM	
45	PA12	I/O	USB_OTG_FS_DP	
46	PA13 *	I/O	SYS_JTMS-SWDIO	
47	VCAP_2	Power		
48	VDD	Power		
49	PA14 *	I/O	SYS_JTCK-SWCLK	
51	PC10	I/O	USART3_TX	RS485S_TX
52	PC11	I/O	USART3_RX	RS485S_RX
53	PC12 **	I/O	GPIO_Output	RS485S_DIR
55	PB3 **	I/O	GPIO_Input	DIP_4
57	PB5 **	I/O	GPIO_Output	RS485M_DIR
58	PB6	I/O	USART1_TX	RS485M_TX
59	PB7	I/O	USART1_RX	RS485M_RX
60	BOOT0	Boot		
61	PB8 **	I/O	GPIO_Input	HW_SEL0
62	PB9 **	I/O	GPIO_Input	HW_SEL1
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	FW00054
Project Folder	D:\svn\firmware\FW00054\trunk
Toolchain / IDE	TrueSTUDIO
Firmware Package Name and Version	STM32Cube FW_F2 V1.7.0

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	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

6. Power Consumption Calculator report

6.1. Microcontroller Selection

Series	STM32F2
Line	STM32F2x5
MCU	STM32F205RCTx
Datasheet	15818_Rev15

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

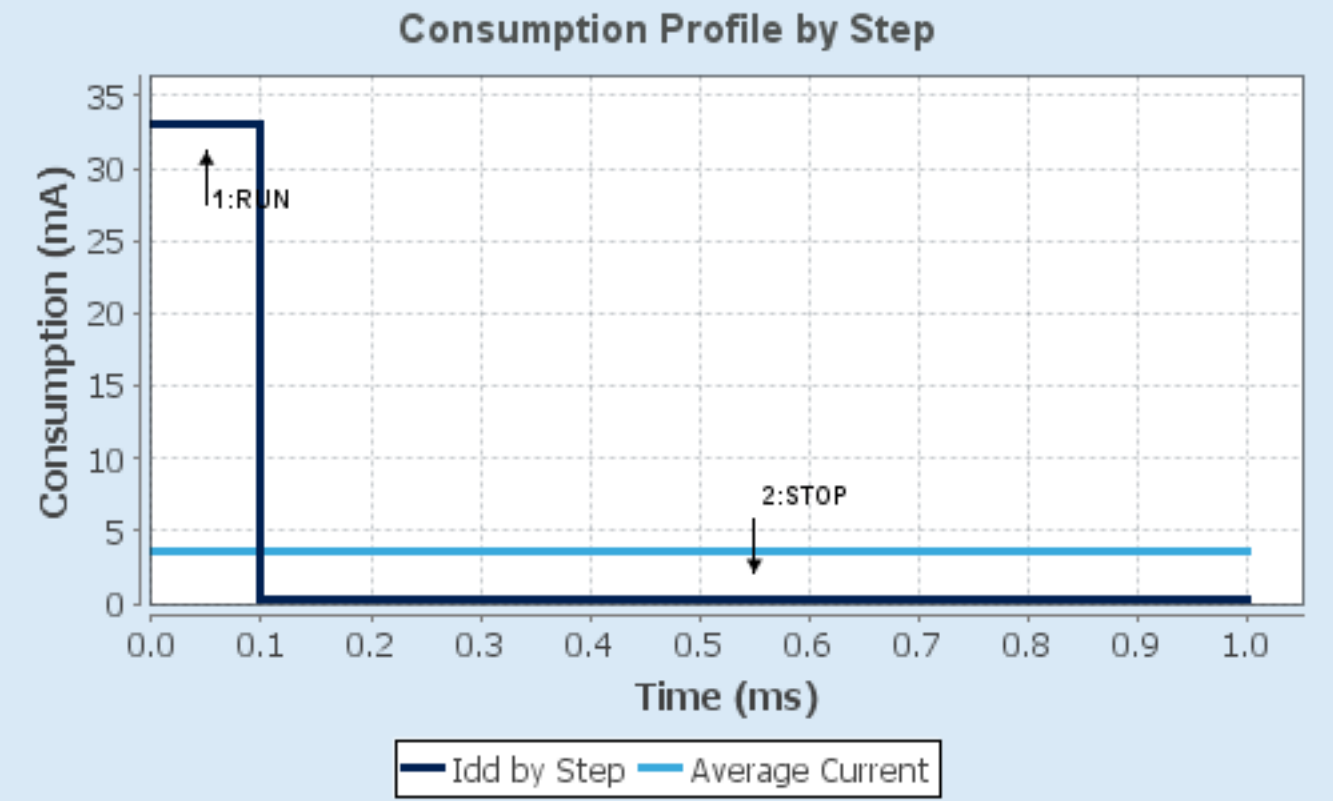
6.4. Sequence

Step	Step1	Step2
Mode	RUN	STOP
Vdd	3.3	3.3
Voltage Source	Battery	Battery
Range	No-Scale	No Scale
Fetch Type	FLASH	n/a
CPU Frequency	120 MHz	0 Hz
Clock Configuration	HSE PLL	Regulator_LP Flash-PwrDwn
Clock Source Frequency	4 MHz	0 Hz
Peripherals		
Additional Cons.	0 mA	0 mA
Average Current	33 mA	300 µA
Duration	0.1 ms	0.9 ms
DMIPS	150.0	0.0
Ta Max	100.1	104.96
Category	In DS Table	In DS Table

6.5. RESULTS

Sequence Time	1 ms	Average Current	3.57 mA
Battery Life	1 month, 9 days, 5 hours	Average DMIPS	150.0 DMIPS

6.6. Chart


Consumption Profile by Step
Consumption (mA)
35
30
25
20
15
10
5
0
1:RUN
2:STOP
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
Time (ms)
Idd by Step
Average Current

7. IPs and Middleware Configuration

7.1. CRC

mode: Activated

7.2. GPIO

7.3. IWDG

mode: Activated

7.3.1. Parameter Settings:

Clocking:

IWDG counter clock prescaler	**16 ***
IWDG down-counter reload value	4095

7.4. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

Low Speed Clock (LSE) : Crystal/Ceramic Resonator

7.4.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Enabled
Data Cache	Enabled
Flash Latency(WS)	0 WS (1 CPU cycle)

RCC Parameters:

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

7.5. RTC

mode: Activate Clock Source

7.5.1. Parameter Settings:

General:

Hour Format	Hourformat 24
Asynchronous Predivider value	127
Synchronous Predivider value	255

7.6. SYS

Timebase Source: SysTick

7.7. TIM1

Channel1: PWM Generation CH1

7.7.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**5 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**49999 ***
Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 8 bits value)	0
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)

Break And Dead Time management - BRK Configuration:

BRK State	Disable
BRK Polarity	High

Break And Dead Time management - Output Configuration:

Automatic Output State	Disable
Off State Selection for Run Mode (OSSR)	Disable
Off State Selection for Idle Mode (OSSI)	Disable
Lock Configuration	Off

PWM Generation Channel 1:

Mode	PWM mode 1
Pulse (16 bits value)	0
Fast Mode	Disable
CH Polarity	High
CH Idle State	Reset

7.8. TIM2

Clock Source : Internal Clock

7.8.1. 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)

7.9. TIM3

Channel4: PWM Generation CH4

7.9.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**7499 ***
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 4:

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

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. USART3

Mode: Asynchronous

7.11.1. 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

7.12. USB_OTG_FS

Mode: Device_Only

7.12.1. Parameter Settings:

Speed	Device Full Speed 12MBit/s
Low power	Disabled
VBUS sensing	Disabled
Signal start of frame	Disabled

7.13. USB_DEVICE

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

7.13.1. 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 (Enable user string descriptor)	Disabled
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

7.13.2. 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	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	
TIM1	PA8	TIM1_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	LCD_PWM
TIM3	PB1	TIM3_CH4	Alternate Function Push Pull	No pull-up and no pull-down	Low	BUZZER
USART1	PB6	USART1_TX	Alternate Function Push Pull	Pull-up	**High ***	RS485M_TX
	PB7	USART1_RX	Alternate Function Push Pull	Pull-up	**High ***	RS485M_RX
USART3	PC10	USART3_TX	Alternate Function Push Pull	Pull-up	**High ***	RS485S_TX
	PC11	USART3_RX	Alternate Function Push Pull	Pull-up	**High ***	RS485S_RX
USB_OTG_FS	PA11	USB_OTG_FS_DM	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PA12	USB_OTG_FS_DP	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
Single Mapped Signals	PC13	RTC_AF1	n/a	n/a	n/a	
	PA9	USB_OTG_FS_VBUS	Input mode	No pull-up and no pull-down	n/a	
	PA10	USB_OTG_FS_ID	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PA13	SYS_JTMS-SWDIO	n/a	n/a	**n/a**	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	**n/a**	
GPIO	PC0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_D0
	PC1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_D1
	PC2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_D2
	PC3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_D3
	PA0-WKUP	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	SW5
	PA1	GPIO_Input	Input mode	**Pull-up ***	n/a	DIP_5
	PA2	GPIO_Input	Input mode	**Pull-up ***	n/a	DIP_6
	PA3	GPIO_Input	Input mode	**Pull-up ***	n/a	DIP_1
	PA4	GPIO_Input	Input mode		n/a	DIP_2

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
				Pull-up *		
	PA5	GPIO_Input	Input mode	**Pull-up ***	n/a	DIP_3
	PA6	GPIO_Input	Input mode	**Pull-up ***	n/a	DIP_4
	PA7	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	SW1
	PC4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_D4
	PC5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_D5
	PB0	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	SW2
	PB2	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	SW3
	PB10	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	SW4
	PB11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_CS
	PB12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_CLR
	PB13	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_RS
	PB14	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_RW
	PB15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_EN
	PC6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_D6
	PC7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LCD_D7
	PC8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_V
	PC9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_R
	PC12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	RS485S_DIR
	PB3	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	DIP_4
	PB5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	RS485M_DIR
	PB8	GPIO_Input	Input mode	**Pull-up ***	n/a	HW_SEL0
	PB9	GPIO_Input	Input mode	**Pull-up ***	n/a	HW_SEL1

8.2. DMA configuration

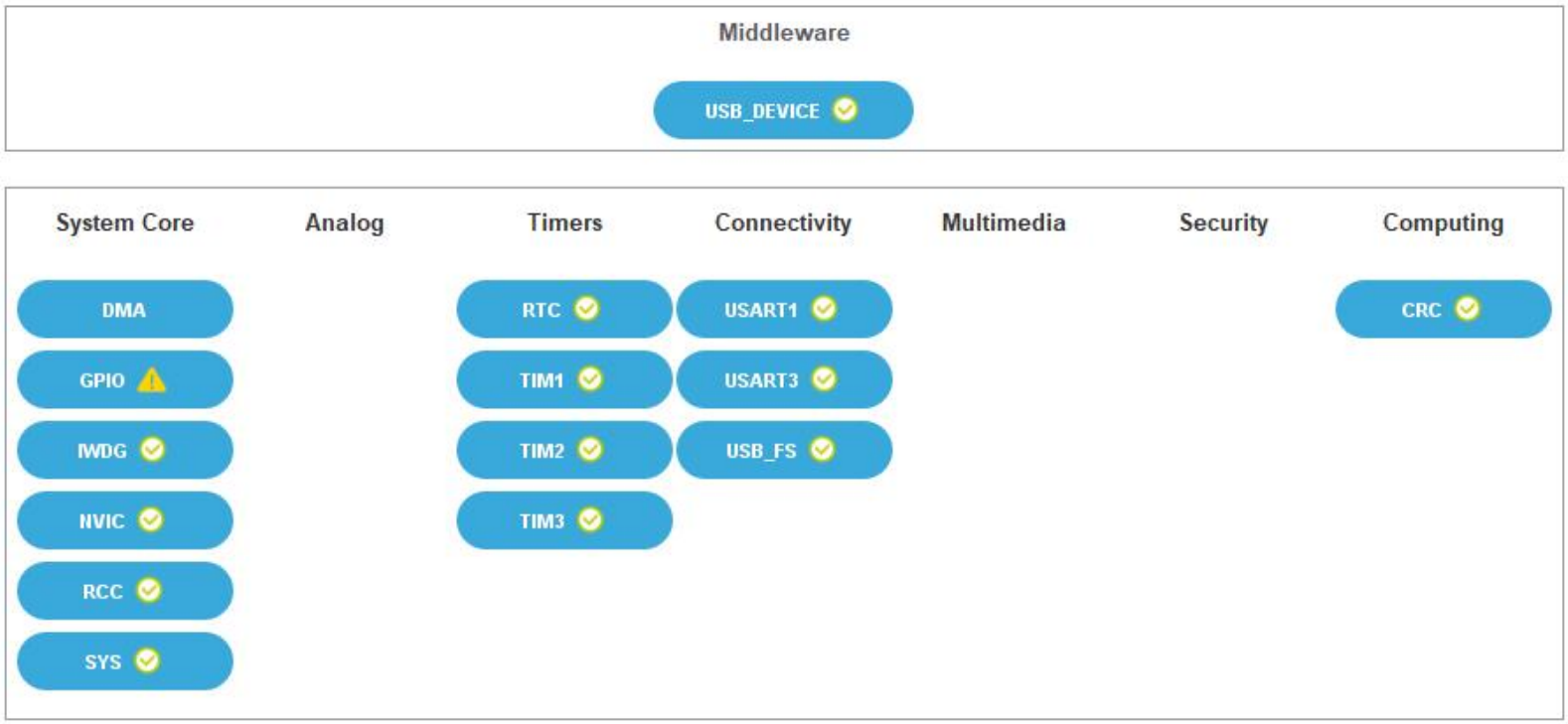
nothing configured in DMA service

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
USART1 global interrupt	true	0	0
USART3 global interrupt	true	0	0
USB On The Go FS global interrupt	true	0	0
PVD interrupt through EXTI line16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
TIM1 break interrupt and TIM9 global interrupt	unused		
TIM1 update interrupt and TIM10 global interrupt	unused		
TIM1 trigger and commutation interrupts and TIM11 global interrupt	unused		
TIM1 capture compare interrupt	unused		
TIM2 global interrupt	unused		
TIM3 global interrupt	unused		

*** User modified value**

9. Predefined Views - Category view : Current



10. Software Pack Report