1. Description

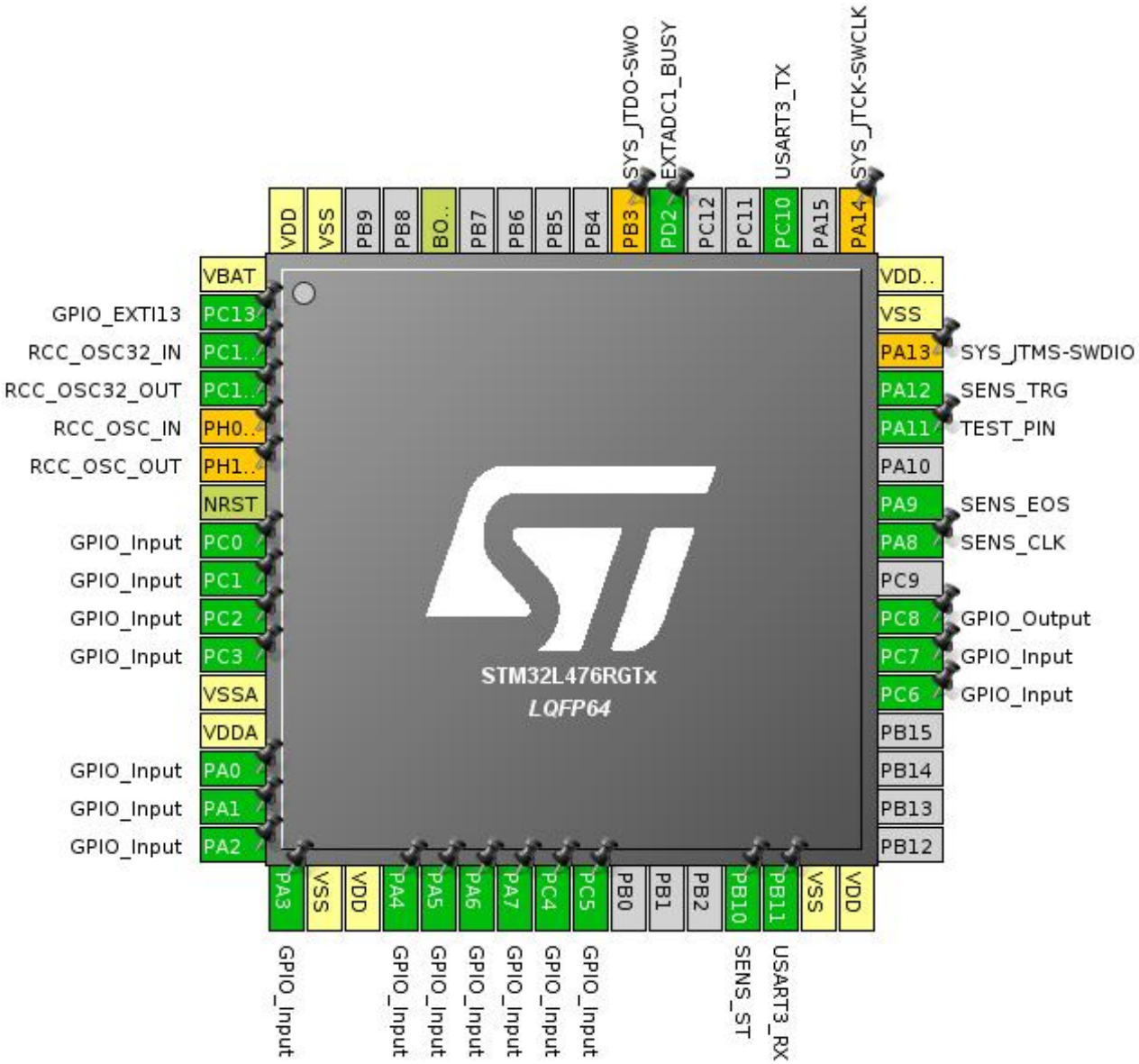
1.1. Project

Project Name	minispec_v_alpha_3_CUBE_ONLY
Board Name	NUCLEO-L476RG
Generated with:	STM32CubeMX 4.20.1
Date	06/14/2017

1.2. MCU

MCU Series	STM32L4
MCU Line	STM32L4x6
MCU name	STM32L476RGTx
MCU Package	LQFP64
MCU Pin number	64

2. Pinout Configuration



3. Pins Configuration

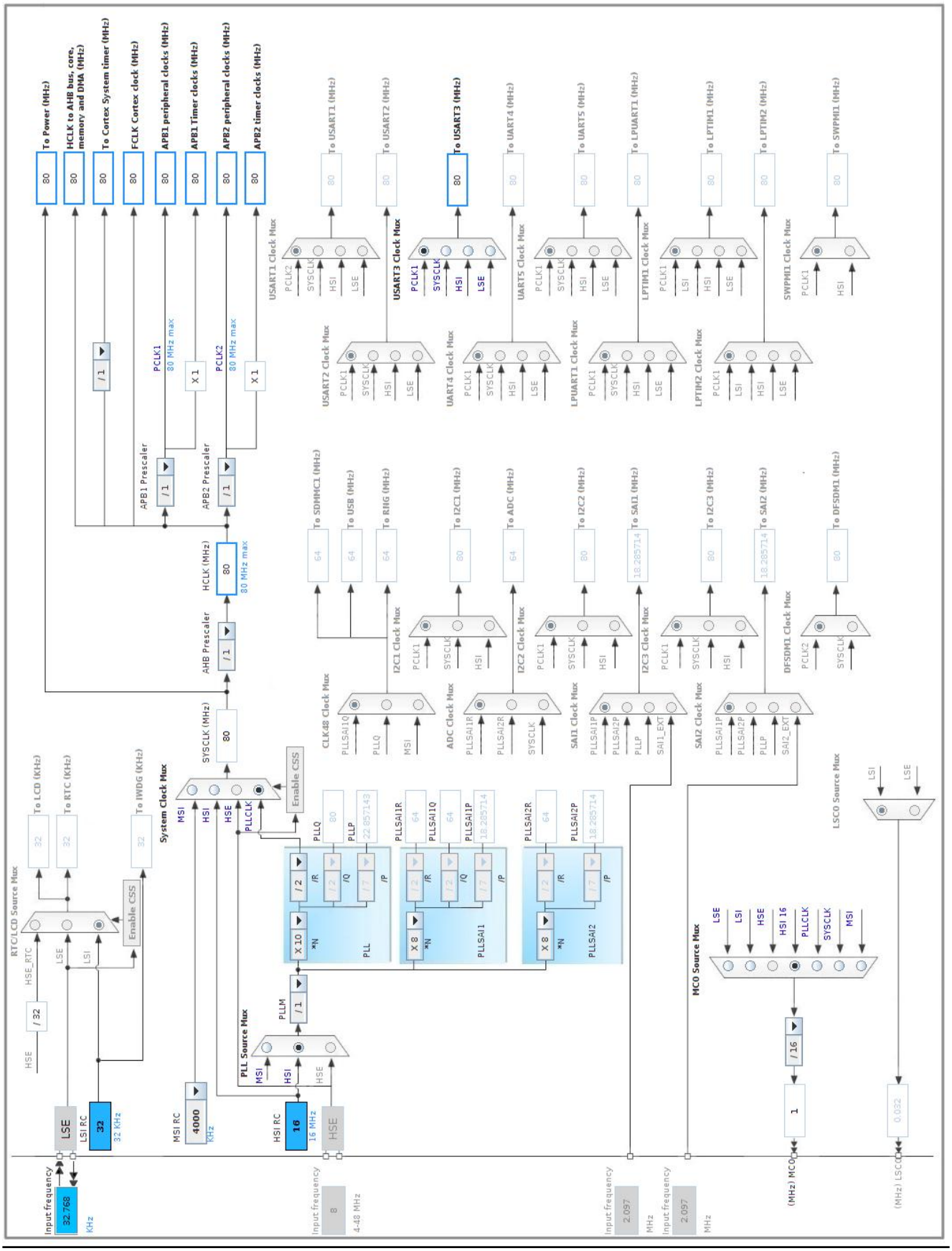
Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
2	PC13	I/O	GPIO_EXTI13	
3	PC14/OSC32_IN	I/O	RCC_OSC32_IN	
4	PC15/OSC32_OUT	I/O	RCC_OSC32_OUT	
5	PH0/OSC_IN *	I/O	RCC_OSC_IN	
6	PH1/OSC_OUT *	I/O	RCC_OSC_OUT	
7	NRST	Reset		
8	PC0 **	I/O	GPIO_Input	
9	PC1 **	I/O	GPIO_Input	
10	PC2 **	I/O	GPIO_Input	
11	PC3 **	I/O	GPIO_Input	
12	VSSA	Power		
13	VDDA	Power		
14	PA0 **	I/O	GPIO_Input	
15	PA1 **	I/O	GPIO_Input	
16	PA2 **	I/O	GPIO_Input	
17	PA3 **	I/O	GPIO_Input	
18	VSS	Power		
19	VDD	Power		
20	PA4 **	I/O	GPIO_Input	
21	PA5 **	I/O	GPIO_Input	
22	PA6 **	I/O	GPIO_Input	
23	PA7 **	I/O	GPIO_Input	
24	PC4 **	I/O	GPIO_Input	
25	PC5 **	I/O	GPIO_Input	
29	PB10	I/O	TIM2_CH3	SENS_ST
30	PB11	I/O	USART3_RX	
31	VSS	Power		
32	VDD	Power		
37	PC6 **	I/O	GPIO_Input	
38	PC7 **	I/O	GPIO_Input	
39	PC8 **	I/O	GPIO_Output	
41	PA8	I/O	RCC_MCO	SENS_CLK
42	PA9	I/O	TIM1_CH2	SENS_EOS
44	PA11	I/O	TIM1_CH4	TEST_PIN
45	PA12	I/O	TIM1_ETR	SENS_TRG

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
46	PA13 *	I/O	SYS_JTMS-SWDIO	
47	VSS	Power		
48	VDDUSB	Power		
49	PA14 *	I/O	SYS_JTCK-SWCLK	
51	PC10	I/O	USART3_TX	
54	PD2	I/O	GPIO_EXTI2	EXTADC1_BUSY
55	PB3 *	I/O	SYS_JTDO-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. IPs and Middleware Configuration

5.1. RCC

Low Speed Clock (LSE) : Crystal/Ceramic Resonator
mode: Master Clock Output

5.1.1. Parameter Settings:

System Parameters:	
VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	**Enabled ***
Data Cache	Enabled
Flash Latency(WS)	4 WS (5 CPU cycle)
RCC Parameters:	
HSI Calibration Value	16
MSI Calibration Value	0
MSI Auto Calibration	Disabled
HSE Startup Timout Value (ms)	100
LSE Startup Timout Value (ms)	5000
Power Parameters:	
Power Regulator Voltage Scale	Power Regulator Voltage Scale 1

5.2. SYS

Timebase Source: SysTick

5.3. TIM1

Slave Mode: Trigger Mode
Trigger Source: ITR1
Clock Source : ETR2
Channel2: Input Capture direct mode
Channel4: PWM Generation CH4
mode: One Pulse Mode

5.3.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**300 ***
Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 8 bits value)	0
Slave Mode Controller	Trigger Mode

Trigger Output (TRGO) Parameters:

Master/Slave Mode	Disable (no sync between this TIM (Master) and its Slaves
Trigger Event Selection TRGO	Reset (UG bit from TIMx_EGR)
Trigger Event Selection TRGO2	Reset (UG bit from TIMx_EGR)

Break And Dead Time management - BRK Configuration:

BRK State	Disable
BRK Polarity	High
BRK Filter (4 bits value)	0
BRK Sources Configuration	
- Digital Input	Disable
- COMP1	Disable
- COMP2	Disable
- DFSDM	Disable

Break And Dead Time management - BRK2 Configuration:

BRK2 State	Disable
BRK2 Polarity	High
BRK2 Filter (4 bits value)	0
BRK2 Sources Configuration	
- Digital Input	Disable
- COMP1	Disable
- COMP2	Disable
- DFSDM	Disable

Break And Dead Time management - Output Configuration:

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

Clock:

Clock Filter (4 bits value)	0
Clock Polarity	**Inverted ***
Clock Prescaler	Prescaler not used

Clear Input:

Clear Input Source	Disable

Input Capture Channel 2:

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

PWM Generation Channel 4:

Mode	**PWM mode 2 ***
Pulse (16 bits value)	**80 ***
Fast Mode	Disable
CH Polarity	High
CH Idle State	Reset

5.4. TIM2

Clock Source : Internal Clock
Channel3: PWM Generation CH3
mode: One Pulse Mode

5.4.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**80 ***
Counter Mode	Up
Counter Period (AutoReload Register - 32 bits value)	**1100 ***
Internal Clock Division (CKD)	No Division

Trigger Output (TRGO) Parameters:

Master/Slave Mode	**Enable (sync between this TIM (Master) and its Slaves (through TRGO)) ***
Trigger Event Selection TRGO	**Update Event ***

Clear Input:

Clear Input Source	Disable

PWM Generation Channel 3:

Mode	**PWM mode 2 ***
Pulse (32 bits value)	**1 ***
Fast Mode	Disable
CH Polarity	High

5.5. TIM5

mode: Clock Source

5.5.1. 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

Trigger Output (TRGO) Parameters:

Master/Slave Mode	Disable (no sync between this TIM (Master) and its Slaves
Trigger Event Selection TRGO	Reset (UG bit from TIMx_EGR)

5.6. USART3

Mode: Asynchronous

5.6.1. 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
Single Sample	Disable

Advanced Features:

Auto Baudrate	Disable
TX Pin Active Level Inversion	Disable
RX Pin Active Level Inversion	Disable
Data Inversion	Disable
TX and RX Pins Swapping	Disable
Overrun	**Disable ***
DMA on RX Error	**Disable ***

MSB First	Disable

*** User modified value**

6. System Configuration

6.1. 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	
	PA8	RCC_MCO	Alternate Function Push Pull	No pull-up and no pull-down	Low	SENS_CLK
TIM1	PA9	TIM1_CH2	Alternate Function Push Pull	No pull-up and no pull-down	Low	SENS_EOS
	PA11	TIM1_CH4	Alternate Function Push Pull	No pull-up and no pull-down	Low	TEST_PIN
	PA12	TIM1_ETR	Alternate Function Push Pull	No pull-up and no pull-down	Low	SENS_TRG
TIM2	PB10	TIM2_CH3	Alternate Function Push Pull	No pull-up and no pull-down	Low	SENS_ST
USART3	PB11	USART3_RX	Alternate Function Push Pull	Pull-up	**Very High ***	
	PC10	USART3_TX	Alternate Function Push Pull	Pull-up	**Very High ***	
Single Mapped Signals	PH0/OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	
	PH1/OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	
	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
	PB3	SYS_JTDO-SWO	n/a	n/a	n/a	
GPIO	PC13	GPIO_EXTI13	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	
	PC0	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	
	PC1	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	
	PC2	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	
	PC3	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	
	PA0	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	
	PA1	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	
	PA2	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	
	PA3	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	
	PA4	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	
	PA5	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PA6	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	
	PA7	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	
	PC4	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	
	PC5	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	
	PC6	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	
	PC7	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	
	PC8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PD2	GPIO_EXTI2	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	EXTADC1_BUSY

6.2. DMA configuration

nothing configured in DMA service

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
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
EXTI line2 interrupt	true	0	0
TIM1 update interrupt and TIM16 global interrupt	true	0	0
USART3 global interrupt	true	0	0
PVD/PVM1/PVM2/PVM3/PVM4 interrupts through EXTI lines 16/35/36/37/38	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
TIM1 break interrupt and TIM15 global interrupt	unused		
TIM1 trigger and commutation interrupts and TIM17 global interrupt	unused		
TIM1 capture compare interrupt	unused		
TIM2 global interrupt	unused		
EXTI line[15:10] interrupts	unused		
TIM5 global interrupt	unused		
FPU global interrupt	unused		

*** User modified value**

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32L4
Line	STM32L4x6
MCU	STM32L476RGTx
Datasheet	025976_Rev4

7.2. Parameter Selection

Temperature	25
Vdd	3.0

8. Software Project

8.1. Project Settings

Name	Value
Project Name	minispec_v_alpha_3_CUBE_ONLY
Project Folder	/home/rg/ufz/1 MICRO SPEC 2.0/software_devl/CUBE_ONLY
Toolchain / IDE	SW4STM32
Firmware Package Name and Version	STM32Cube FW_L4 V1.7.0

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	No
Delete previously generated files when not re-generated	Yes
Set all free pins as analog (to optimize the power consumption)	No