1. Description

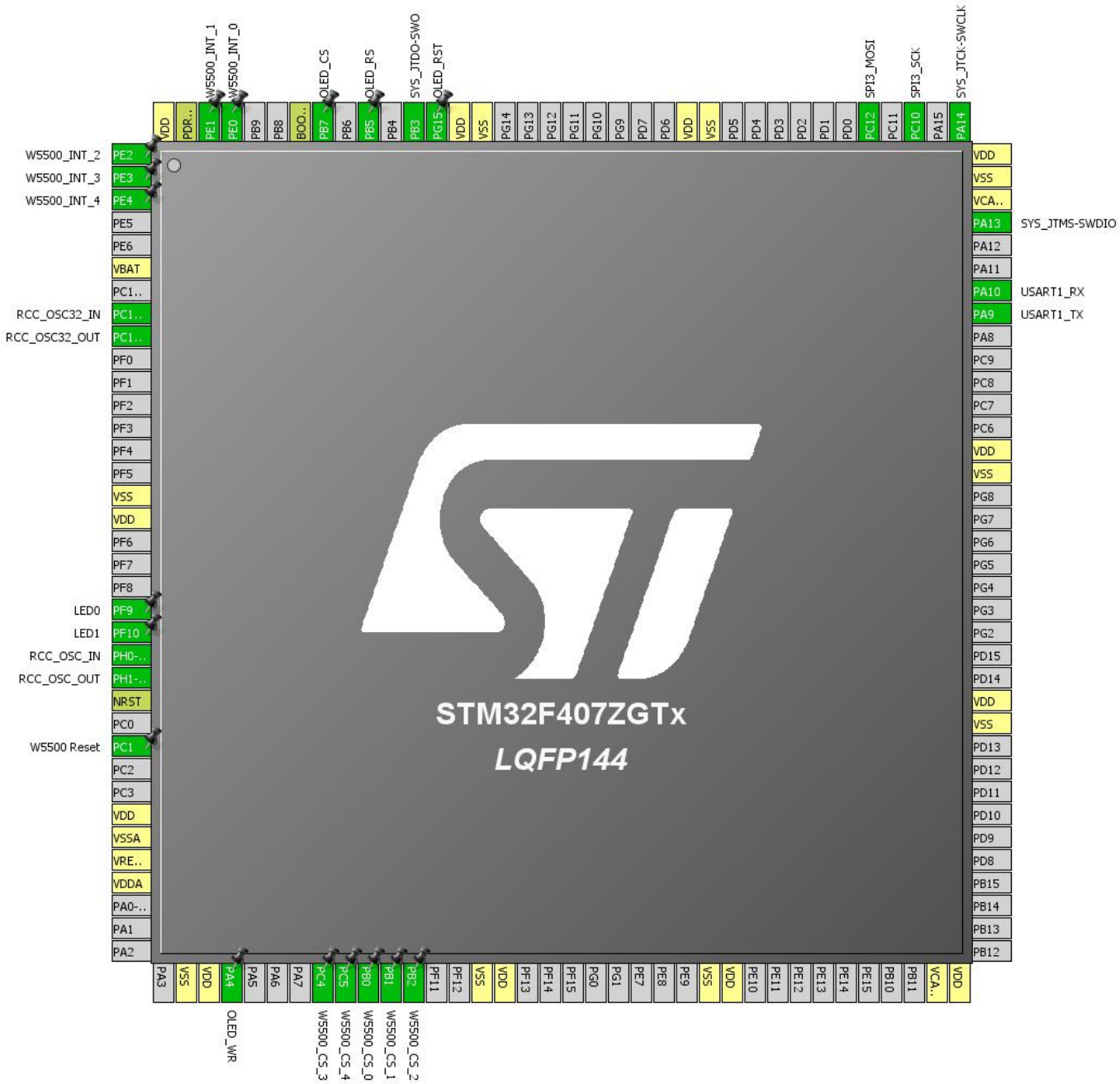
1.1. Project

Project Name	oled
Board Name	oled
Generated with:	STM32CubeMX 4.10.1
Date	10/29/2015

1.2. MCU

MCU Series	STM32F4
MCU Line	STM32F407/417
MCU name	STM32F407ZGTx
MCU Package	LQFP144
MCU Pin number	144

2. Pinout Configuration



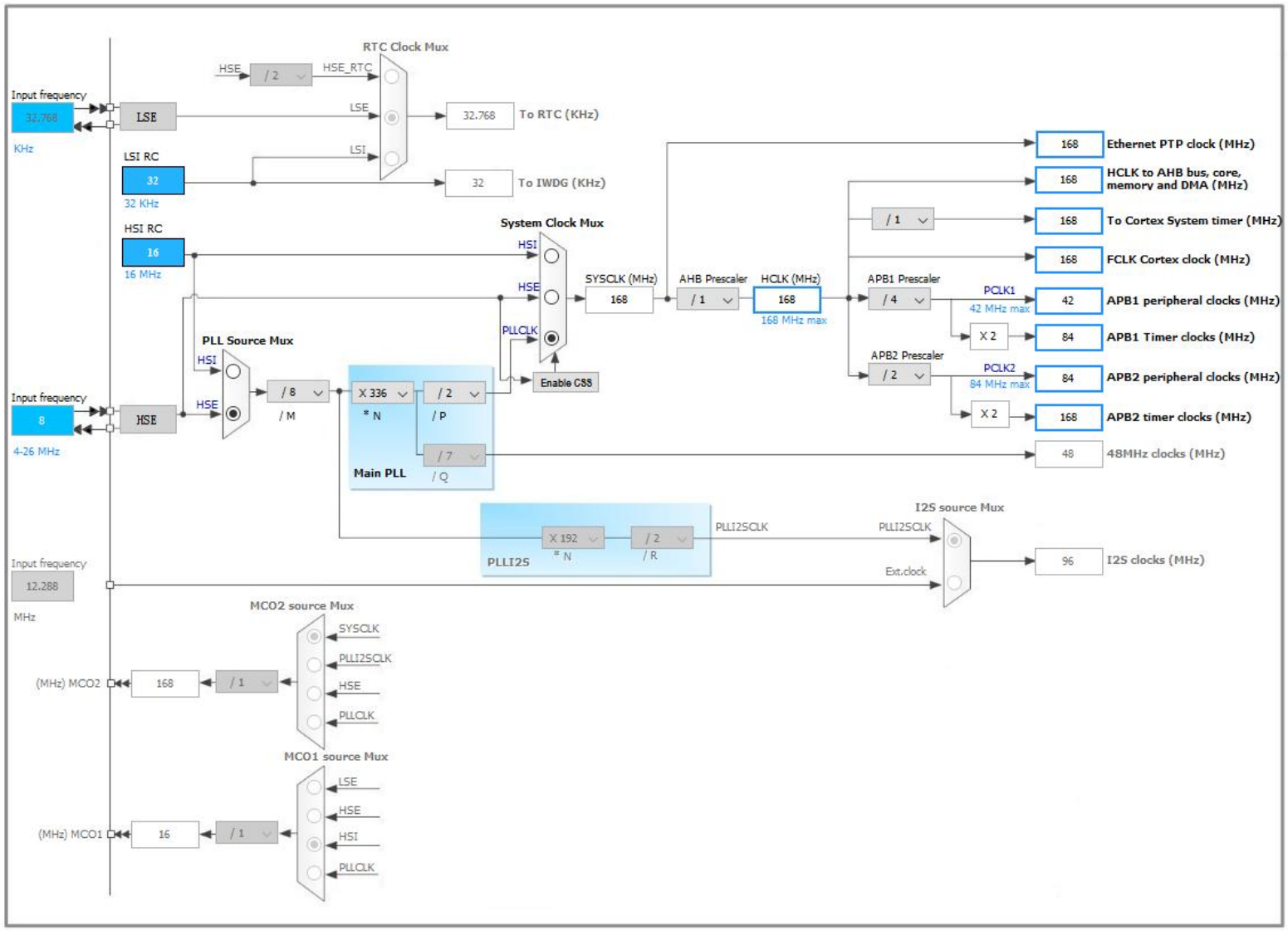
3. Pins Configuration

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	PE2	I/O	GPIO_EXTI2	W5500_INT_2
2	PE3	I/O	GPIO_EXTI3	W5500_INT_3
3	PE4	I/O	GPIO_EXTI4	W5500_INT_4
6	VBAT	Power		
8	PC14-OSC32_IN	I/O	RCC_OSC32_IN	
9	PC15-OSC32_OUT	I/O	RCC_OSC32_OUT	
16	VSS	Power		
17	VDD	Power		
21	PF9 *	I/O	GPIO_Output	LED0
22	PF10 *	I/O	GPIO_Output	LED1
23	PH0-OSC_IN	I/O	RCC_OSC_IN	
24	PH1-OSC_OUT	I/O	RCC_OSC_OUT	
25	NRST	Reset		
27	PC1 *	I/O	GPIO_Output	W5500 Reset
30	VDD	Power		
31	VSSA	Power		
32	VREF+	Power		
33	VDDA	Power		
38	VSS	Power		
39	VDD	Power		
40	PA4 *	I/O	GPIO_Output	OLED_WR
44	PC4 *	I/O	GPIO_Output	W5500_CS_3
45	PC5 *	I/O	GPIO_Output	W5500_CS_4
46	PB0 *	I/O	GPIO_Output	W5500_CS_0
47	PB1 *	I/O	GPIO_Output	W5500_CS_1
48	PB2 *	I/O	GPIO_Output	W5500_CS_2
51	VSS	Power		
52	VDD	Power		
61	VSS	Power		
62	VDD	Power		
71	VCAP_1	Power		
72	VDD	Power		
83	VSS	Power		
84	VDD	Power		
94	VSS	Power		
95	VDD	Power		

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
101	PA9	I/O	USART1_TX	
102	PA10	I/O	USART1_RX	
105	PA13	I/O	SYS_JTMS-SWDIO	
106	VCAP_2	Power		
107	VSS	Power		
108	VDD	Power		
109	PA14	I/O	SYS_JTCK-SWCLK	
111	PC10	I/O	SPI3_SCK	
113	PC12	I/O	SPI3_MOSI	
120	VSS	Power		
121	VDD	Power		
130	VSS	Power		
131	VDD	Power		
132	PG15 *	I/O	GPIO_Output	OLED_RST
133	PB3	I/O	SYS_JTDO-SWO	
135	PB5 *	I/O	GPIO_Output	OLED_RS
137	PB7 *	I/O	GPIO_Output	OLED_CS
138	BOOT0	Boot		
141	PE0	I/O	GPIO_EXTI0	W5500_INT_0
142	PE1	I/O	GPIO_EXTI1	W5500_INT_1
143	PDR_ON	Reset		
144	VDD	Power		

* The pin is affected with an I/O function

4. Clock Tree Configuration



5. IPs and Middleware Configuration

5.1. CRC

mode: Activated

5.2. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator
Low Speed Clock (LSE) : Crystal/Ceramic Resonator

5.2.1. Parameter Settings:

System Parameters:	
VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Enabled
Data Cache	Enabled
Flash Latency(WS)	5 WS (6 CPU cycle)
RCC Parameters:	
HSI Calibration Value	16
Power Parameters:	
Power Regulatror Voltage Scale	Power Regulator Voltage Scale 1

5.3. SPI3

Mode: Transmit Only Master

5.3.1. Parameter Settings:

Basic Parameters:	
Frame Format	Motorola
Data Size	8 Bits
First Bit	MSB First
Clock Parameters:	
Prescaler (for Baud Rate)	**64 ***
Baud Rate	**656.25 KBits/s ***
Clock Polarity (CPOL)	**High ***

Clock Phase (CPHA)	**2 Edge ***

Advanced Parameters:

CRC Calculation	Disabled
NSS Signal Type	Software

5.4. SYS

Debug: SWD and Asynchronous Trace

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. FREERTOS

mode: Enabled

5.6.1. Config parameters:

Versions:

CMSIS-RTOS version	1.02
FreeRTOS version	8.2.1

Kernel settings:

USE_PREEMPTION	Enabled
CPU_CLOCK_HZ	SystemCoreClock
TICK_RATE_HZ	**200 ***
MAX_PRIORITIES	7
MINIMAL_STACK_SIZE	

	64 *
MAX_TASK_NAME_LEN	16
USE_16_BIT_TICKS	Disabled
IDLE_SHOULD_YIELD	Enabled
USE_MUTEXES	Enabled
USE_RECURSIVE_MUTEXES	Enabled
USE_COUNTING_SEMAPHORES	Enabled
QUEUE_REGISTRY_SIZE	8
USE_APPLICATION_TASK_TAG	Disabled
TOTAL_HEAP_SIZE	**100000 ***
Memory Management scheme	**heap_2 ***
USE_ALTERNATIVE_API	Disabled
ENABLE_BACKWARD_COMPATIBILITY	Enabled
USE_PORT_OPTIMISED_TASK_SELECTION	Disabled
USE_TICKLESS_IDLE	Disabled

Hook function related definitions:

USE_IDLE_HOOK	Disabled
USE_TICK_HOOK	Disabled
USE_MALLOC_FAILED_HOOK	Disabled
CHECK_FOR_STACK_OVERFLOW	Disabled

Run time and task stats gathering related definitions:

USE_TRACE_FACILITY	Enabled
GENERATE_RUN_TIME_STATS	Disabled

Co-routine related definitions:

USE_CO_ROUTINES	Disabled
MAX_CO_ROUTINE_PRIORITIES	2

Software timer definitions:

USE_TIMERS	Disabled
TIMER_TASK_PRIORITY	2
TIMER_QUEUE_LENGTH	10

Interrupt nesting behaviour configuration:

LIBRARY_LOWEST_INTERRUPT_PRIORITY	15
LIBRARY_MAX_SYSCALL_INTERRUPT_PRIORITY	5

5.6.2. Include parameters:

Include definitions:

vTaskPrioritySet	Enabled
uxTaskPriorityGet	Enabled
vTaskDelete	Enabled
vTaskCleanUpResources	Disabled

vTaskSuspend	Enabled
vTaskDelayUntil	Disabled
vTaskDelay	Enabled
xTaskGetSchedulerState	Enabled
xTaskResumeFromISR	Enabled
xQueueGetMutexHolder	Disabled
xSemaphoreGetMutexHolder	Disabled
pcTaskGetTaskName	Disabled
uxTaskGetStackHighWaterMark	Disabled
xTaskGetCurrentTaskHandle	Disabled
eTaskGetState	Disabled
xEventGroupSetBitFromISR	Disabled
xTimerPendFunctionCall	Disabled

*** 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	
	PH0-OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	
	PH1-OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	
SPI3	PC10	SPI3_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PC12	SPI3_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
SYS	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	
USART1	PA9	USART1_TX	Alternate Function Push Pull	Pull-up	**High ***	
	PA10	USART1_RX	Alternate Function Push Pull	Pull-up	**High ***	
GPIO	PE2	GPIO_EXTI2	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	W5500_INT_2
	PE3	GPIO_EXTI3	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	W5500_INT_3
	PE4	GPIO_EXTI4	**External Interrupt Mode with Falling edge trigger detection**	**Pull-up ***	n/a	W5500_INT_4
	PF9	GPIO_Output	Output Push Pull	**Pull-up ***	**High ***	LED0
	PF10	GPIO_Output	Output Push Pull	**Pull-up ***	**High ***	LED1
	PC1	GPIO_Output	Output Push Pull	**Pull-up ***	Low	W5500 Reset
	PA4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OLED_WR
	PC4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	W5500_CS_3
	PC5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	W5500_CS_4
	PB0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	W5500_CS_0
	PB1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	W5500_CS_1

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PB2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	W5500_CS_2
	PG15	GPIO_Output	Output Push Pull	**Pull-up ***	**High ***	OLED_RST
	PB5	GPIO_Output	Output Push Pull	**Pull-up ***	**Fast ***	OLED_RS
	PB7	GPIO_Output	Output Push Pull	**Pull-up ***	**High ***	OLED_CS
	PE0	GPIO_EXTI0	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	**n/a**	W5500_INT_0
	PE1	GPIO_EXTI1	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	**n/a**	W5500_INT_1

6.2. DMA configuration

DMA request	Stream	Direction	Priority
MEMTOMEM	DMA2_Stream4	Memory To Memory	Low
MEMTOMEM	DMA2_Stream1	Memory To Memory	Low
USART1_TX	DMA2_Stream7	Memory To Peripheral	Low

MEMTOMEM: DMA2_Stream4 DMA request Settings:

Mode:	Normal
Use fifo:	**Enable ***
FIFO Threshold:	Full
Src MemoryIncrement:	**Enable ***
Dst MemormyIncrement:	**Enable ***
Src Memory Data Width:	**Half Word ***
Src Memory Burst Size:	**4 Increment ***
Dst Memormy Data Width:	**Half Word ***
Dst Memormy Burst Size:	**4 Increment ***

MEMTOMEM: DMA2_Stream1 DMA request Settings:

Mode:	Normal
Use fifo:	**Enable ***
FIFO Threshold:	Full
Src MemoryIncrement:	**Enable ***
Dst MemormyIncrement:	**Enable ***
Src Memory Data Width:	**Half Word ***
Src Memory Burst Size:	**4 Increment ***
Dst Memormy Data Width:	**Half Word ***
Dst Memormy Burst Size:	**4 Increment ***

USART1_TX: DMA2_Stream7 DMA request Settings:

Mode:	Normal
Use fifo:	Disable
PeripheralIncrement:	Disable
MemoryIncrement:	**Enable ***

Peripheral Data Width: Byte

6.3. NVIC configuration

Interrupt Table	Enable	Preenmption Priority	SubPriority
System tick timer	true	0	0
EXTI line4 interrupt	true	5	0
USART1 global interrupt	true	5	0
DMA2 stream1 global interrupt	true	5	0
DMA2 stream7 global interrupt	true	5	0
Non maskable interrupt	unused		
Memory management fault	unused		
Pre-fetch fault, memory access fault	unused		
Undefined instruction or illegal state	unused		
Debug monitor	unused		
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
EXTI line0 interrupt	unused		
EXTI line1 interrupt	unused		
EXTI line2 interrupt	unused		
EXTI line3 interrupt	unused		
SPI3 global interrupt	unused		
DMA2 stream4 global interrupt	unused		

*** User modified value**

7. Power Plugin report

7.1. Microcontroller Selection

Series	STM32F4
Line	STM32F407/417
MCU	STM32F407ZGTx
Datasheet	022152_Rev5

7.2. Parameter Selection

Temperature	25
Vdd	3.3

7.3. Battery Selection

Battery	Li-SOCL2(AAA700)
Capacity	700.0 mAh
Self discharge	0.08 %/month
Nominal voltage	3.6 V
Max Cont Current	10.0 mA
Max Pulse Current	30.0 mA
Cells in series	1
Cells in parallel	1

8. Software Project

8.1. Project Settings

Name	Value
Project Name	oled
Project Folder	D:\My
Toolchain / IDE	EWARM
Firmware Package Name and Version	STM32Cube FW_F4 V1.8.0

8.2. Code Generation Settings

Name	Value
STM32Cube Firmware Library Package	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

8.3. Toolchains Settings

Name	Value
Compiler Optimizations	Balanced Size/Speed