1. Description

1.1. Project

Project Name	LatencyTests
Board Name	NUCLEO-F446ZE
Generated with:	STM32CubeMX 4.21.0
Date	08/29/2017

1.2. MCU

MCU Series	STM32F4
MCU Line	STM32F446
MCU name	STM32F446ZETx
MCU Package	LQFP144
MCU Pin number	144

2. Pinout Configuration
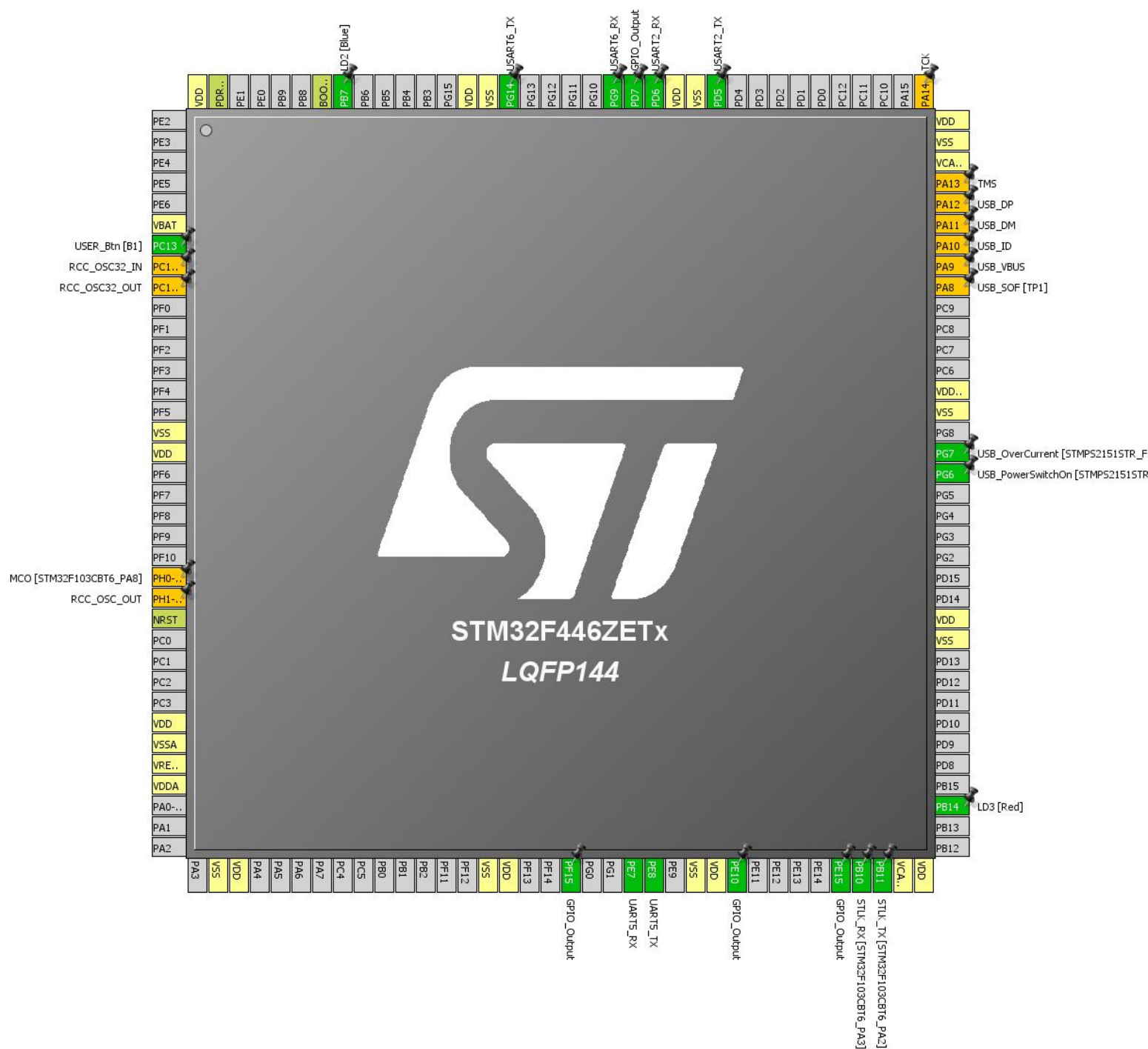
3. Pins Configuration

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
6	VBAT	Power		
7	PC13	I/O	GPIO_EXTI13	USER_Btn [B1]
8	PC14-OSC32_IN *	I/O	RCC_OSC32_IN	
9	PC15-OSC32_OUT *	I/O	RCC_OSC32_OUT	
16	VSS	Power		
17	VDD	Power		
23	PH0-OSC_IN *	I/O	RCC_OSC_IN	MCO [STM32F103CBT6_PA8]
24	PH1-OSC_OUT *	I/O	RCC_OSC_OUT	
25	NRST	Reset		
30	VDD	Power		
31	VSSA	Power		
32	VREF+	Power		
33	VDDA	Power		
38	VSS	Power		
39	VDD	Power		
51	VSS	Power		
52	VDD	Power		
55	PF15 **	I/O	GPIO_Output	
58	PE7	I/O	UART5_RX	
59	PE8	I/O	UART5_TX	
61	VSS	Power		
62	VDD	Power		
63	PE10 **	I/O	GPIO_Output	
68	PE15 **	I/O	GPIO_Output	
69	PB10	I/O	USART3_TX	STLK_RX [STM32F103CBT6_PA3]
70	PB11	I/O	USART3_RX	STLK_TX [STM32F103CBT6_PA2]
71	VCAP_1	Power		
72	VDD	Power		
75	PB14 **	I/O	GPIO_Output	LD3 [Red]
83	VSS	Power		
84	VDD	Power		
91	PG6 **	I/O	GPIO_Output	USB_PowerSwitchOn [STMPS2151STR_EN]

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
92	PG7 **	I/O	GPIO_Input	USB_OverCurrent [STMPS2151STR_FAULT]
94	VSS	Power		
95	VDDUSB	Power		
100	PA8 *	I/O	USB_OTG_FS_SOF	USB_SOF [TP1]
101	PA9 *	I/O	USB_OTG_FS_VBUS	USB_VBUS
102	PA10 *	I/O	USB_OTG_FS_ID	USB_ID
103	PA11 *	I/O	USB_OTG_FS_DM	USB_DM
104	PA12 *	I/O	USB_OTG_FS_DP	USB_DP
105	PA13 *	I/O	SYS_JTMS-SWDIO	TMS
106	VCAP_2	Power		
107	VSS	Power		
108	VDD	Power		
109	PA14 *	I/O	SYS_JTCK-SWCLK	TCK
119	PD5	I/O	USART2_TX	
120	VSS	Power		
121	VDD	Power		
122	PD6	I/O	USART2_RX	
123	PD7 **	I/O	GPIO_Output	
124	PG9	I/O	USART6_RX	
129	PG14	I/O	USART6_TX	
130	VSS	Power		
131	VDD	Power		
137	PB7 **	I/O	GPIO_Output	LD2 [Blue]
138	BOOT0	Boot		
143	PDR_ON	Reset		
144	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
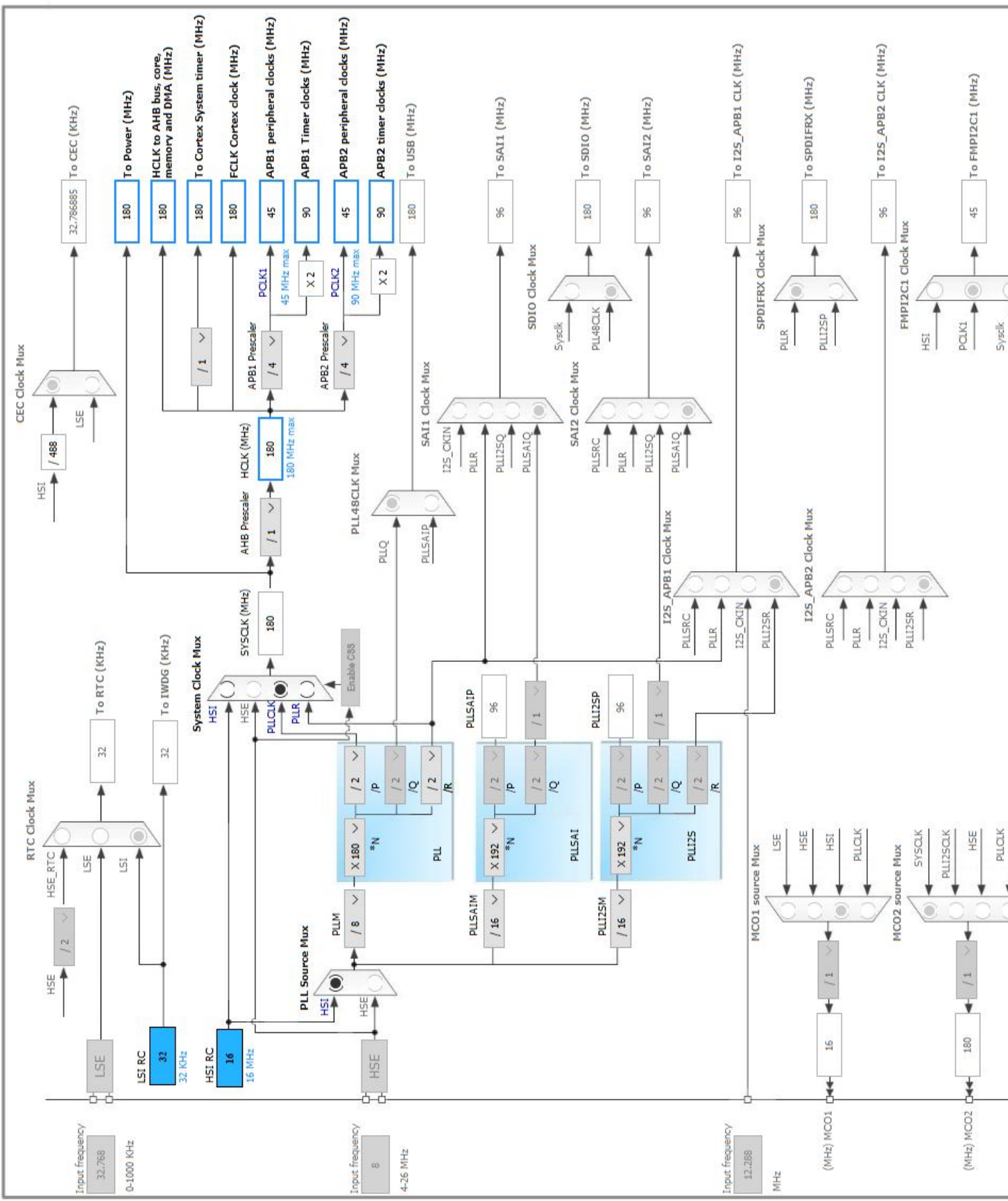
5. IPs and Middleware Configuration

5.1. SYS

Timebase Source: SysTick

5.2. TIM10

mode: Activated

5.2.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**90 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**999 ***
Internal Clock Division (CKD)	No Division

5.3. UART5

Mode: Asynchronous

5.3.1. Parameter Settings:

Basic Parameters:

Baud Rate	**1000000 ***
Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1
Advanced Parameters:	
Data Direction	Receive and Transmit
Over Sampling	16 Samples

5.4. USART2

Mode: Asynchronous

5.4.1. Parameter Settings:

Basic Parameters:

Baud Rate	**1000000 ***
Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples

5.5. USART3

Mode: Asynchronous

5.5.1. Parameter Settings:

Basic Parameters:

Baud Rate	**9600 ***
Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples

5.6. USART6

Mode: Asynchronous

5.6.1. Parameter Settings:

Basic Parameters:

Baud Rate	**1000000 ***
Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1

Advanced Parameters:

Data Direction   Receive and Transmit

Over Sampling   16 Samples

* User modified value

6. System Configuration

6.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
UART5	PE7	UART5_RX	Alternate Function Push Pull	Pull-up	**Very High** *	
	PE8	UART5_TX	Alternate Function Push Pull	Pull-up	**Very High** *	
USART2	PD5	USART2_TX	Alternate Function Push Pull	Pull-up	**Very High** *	
	PD6	USART2_RX	Alternate Function Push Pull	Pull-up	**Very High** *	
USART3	PB10	USART3_TX	Alternate Function Push Pull	Pull-up	**Very High** *	STLK_RX [STM32F103CBT6_PA3]
	PB11	USART3_RX	Alternate Function Push Pull	Pull-up	**Very High** *	STLK_TX [STM32F103CBT6_PA2]
USART6	PG9	USART6_RX	Alternate Function Push Pull	Pull-up	**Very High** *	
	PG14	USART6_TX	Alternate Function Push Pull	Pull-up	**Very High** *	
Single Mapped Signals	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	MCO [STM32F103CBT6_PA8]
	PH1-OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	
	PA8	USB_OTG_FS_SOF	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	USB_SOF [TP1]
	PA9	USB_OTG_FS_VBUS	Input mode	No pull-up and no pull-down	**n/a**	USB_VBUS
	PA10	USB_OTG_FS_ID	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	USB_ID
	PA11	USB_OTG_FS_DM	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	USB_DM

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PA12	USB_OTG_FS_DP	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	USB_DP
	PA13	SYS_JTMS-SWDIO	n/a	n/a	**n/a**	TMS
	PA14	SYS_JTCK-SWCLK	n/a	n/a	**n/a**	TCK
GPIO	PC13	GPIO_EXTI13	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	USER_Btn [B1]
	PF15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High** *	
	PE10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High** *	
	PE15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High** *	
	PB14	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LD3 [Red]
	PG6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	USB_PowerSwitchOn [STMPS2151STR_EN]
	PG7	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	USB_OverCurrent [STMPS2151STR_FAULT]
	PD7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High** *	
	PB7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LD2 [Blue]

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
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
TIM1 update interrupt and TIM10 global interrupt	true	0	0
USART2 global interrupt	true	0	0
USART6 global interrupt	true	0	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
USART3 global interrupt	unused		
EXTI line[15:10] interrupts	unused		
UART5 global interrupt	unused		
FPU global interrupt	unused		

* User modified value

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32F4
Line	STM32F446
MCU	STM32F446ZETx
Datasheet	027107_Rev5

7.2. Parameter Selection

Temperature	25
Vdd	3.6

8. Software Project

8.1. Project Settings

Name	Value
Project Name	LatencyTests
Project Folder	D:\Users\Tyler\Documents\STM\Workspace\Latency Tests\LatencyTests
Toolchain / IDE	SW4STM32
Firmware Package Name and Version	STM32Cube FW_F4 V1.16.0

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	No
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