

1. Description

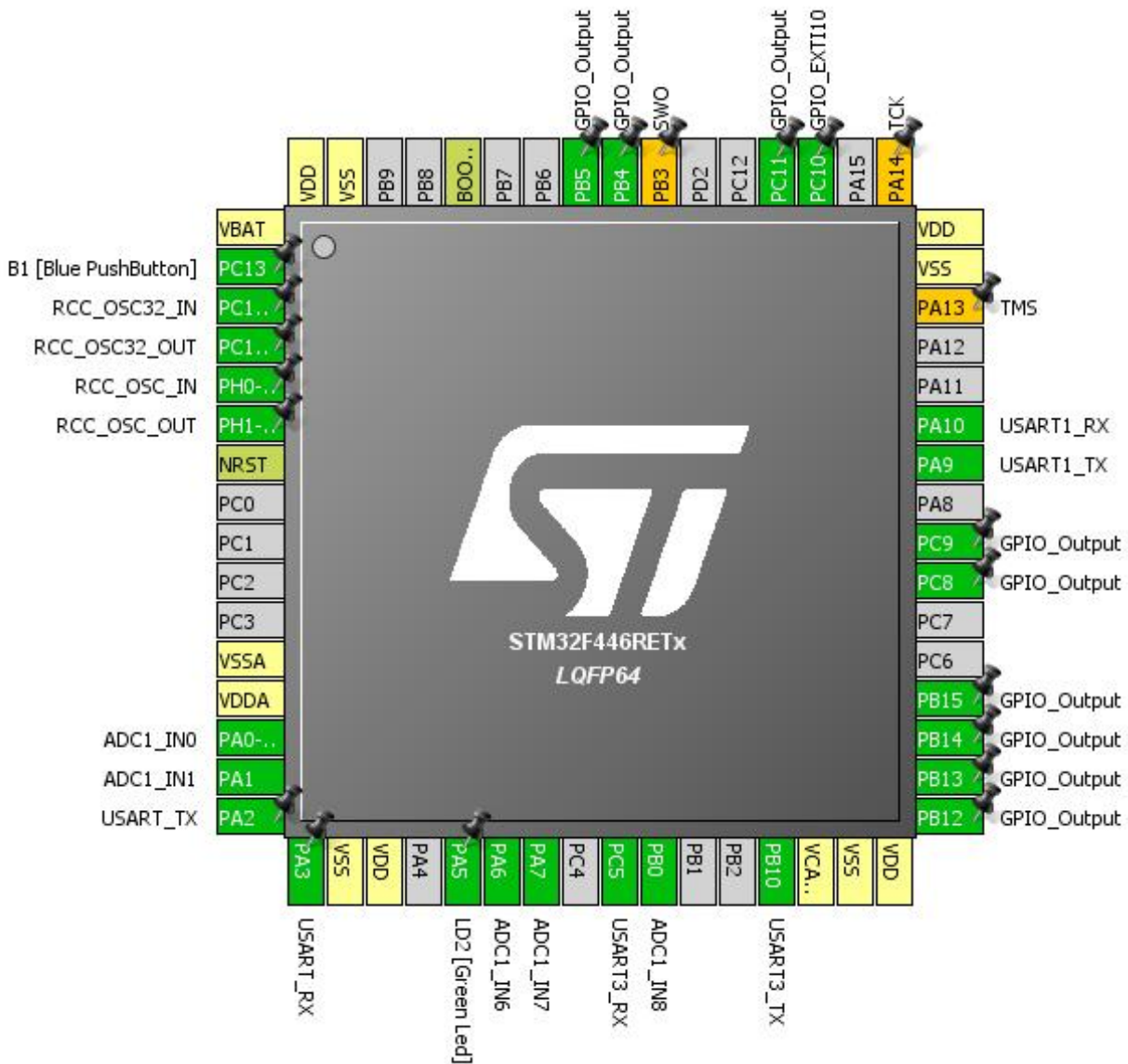
1.1. Project

Project Name	NucleoF446RE_BASE
Board Name	NUCLEO-F446RE
Generated with:	STM32CubeMX 4.16.0
Date	08/30/2016

1.2. MCU

MCU Series	STM32F4
MCU Line	STM32F446
MCU name	STM32F446RETx
MCU Package	LQFP64
MCU Pin number	64

2. Pinout Configuration



3. Pins Configuration

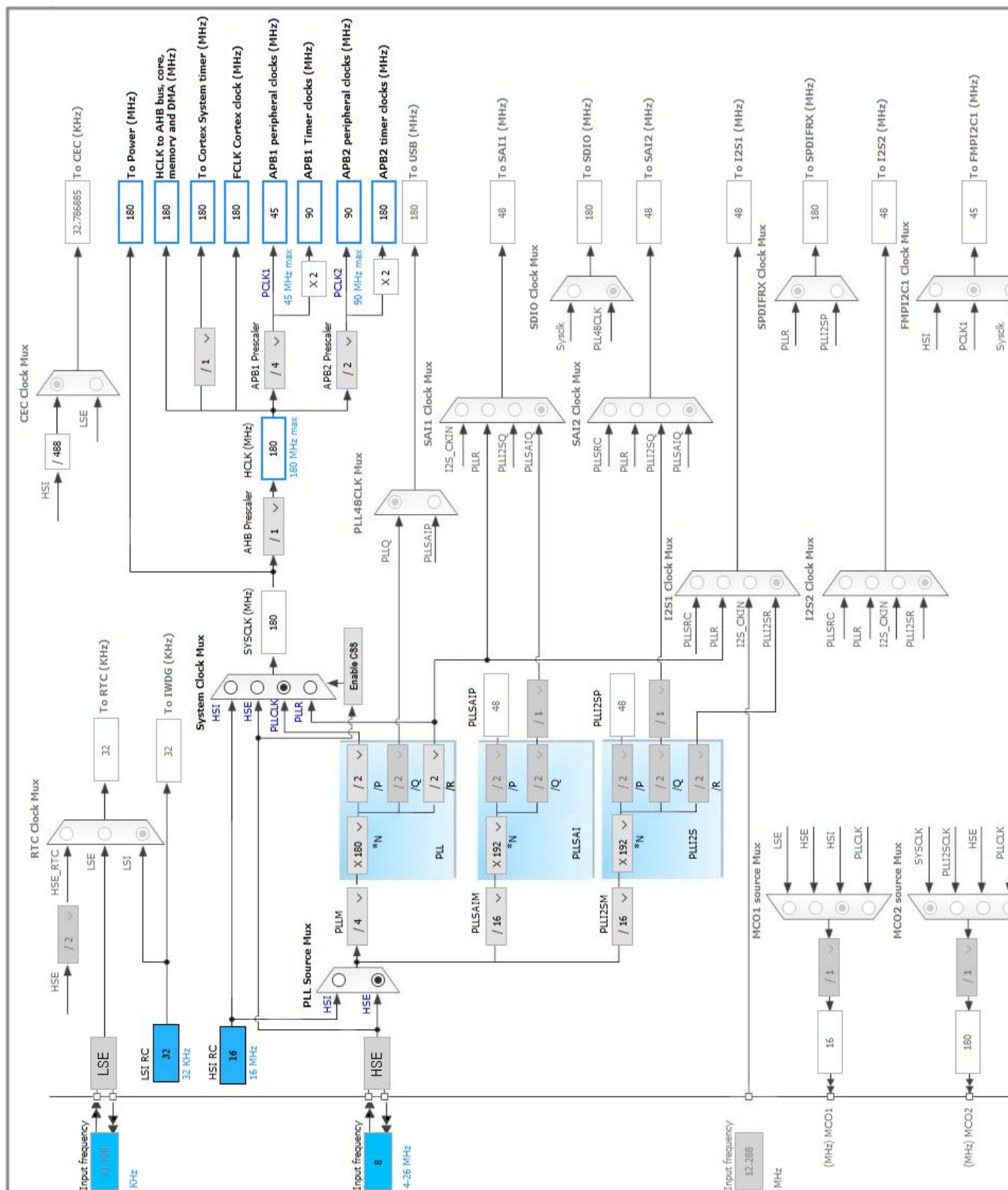
Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
2	PC13	I/O	GPIO_EXTI13	B1 [Blue PushButton]
3	PC14-OSC32_IN	I/O	RCC_OSC32_IN	
4	PC15-OSC32_OUT	I/O	RCC_OSC32_OUT	
5	PH0-OSC_IN	I/O	RCC_OSC_IN	
6	PH1-OSC_OUT	I/O	RCC_OSC_OUT	
7	NRST	Reset		
12	VSSA	Power		
13	VDDA	Power		
14	PA0-WKUP	I/O	ADC1_IN0	
15	PA1	I/O	ADC1_IN1	
16	PA2	I/O	USART2_TX	USART_TX
17	PA3	I/O	USART2_RX	USART_RX
18	VSS	Power		
19	VDD	Power		
21	PA5 *	I/O	GPIO_Output	LD2 [Green Led]
22	PA6	I/O	ADC1_IN6	
23	PA7	I/O	ADC1_IN7	
25	PC5	I/O	USART3_RX	
26	PB0	I/O	ADC1_IN8	
29	PB10	I/O	USART3_TX	
30	VCAP_1	Power		
31	VSS	Power		
32	VDD	Power		
33	PB12 *	I/O	GPIO_Output	
34	PB13 *	I/O	GPIO_Output	
35	PB14 *	I/O	GPIO_Output	
36	PB15 *	I/O	GPIO_Output	
39	PC8 *	I/O	GPIO_Output	
40	PC9 *	I/O	GPIO_Output	
42	PA9	I/O	USART1_TX	
43	PA10	I/O	USART1_RX	
46	PA13 **	I/O	SYS_JTMS-SWDIO	TMS
47	VSS	Power		
48	VDD	Power		
49	PA14 **	I/O	SYS_JTCK-SWCLK	TCK

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
51	PC10	I/O	GPIO_EXTI10	
52	PC11 *	I/O	GPIO_Output	
55	PB3 **	I/O	SYS_JTDO-SWO	SWO
56	PB4 *	I/O	GPIO_Output	
57	PB5 *	I/O	GPIO_Output	
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. ADC1

mode: IN0

mode: IN1

mode: IN6

mode: IN7

mode: IN8

5.1.1. Parameter Settings:

ADCs_Common_Settings:

Mode Independent mode

ADC_Settings:

Clock Prescaler PCLK2 divided by 2

Resolution 12 bits (15 ADC Clock cycles)

Data Alignment Right alignment

Scan Conversion Mode **Enabled ***

Continuous Conversion Mode **Enabled ***

Discontinuous Conversion Mode Disabled

DMA Continuous Requests **Enabled ***

End Of Conversion Selection EOC flag at the end of single channel conversion

ADC_Regular_ConversionMode:

Number Of Conversion **5 ***

External Trigger Conversion Edge None

Rank 1

Channel Channel 0

Sampling Time **480 Cycles ***

Rank **2 ***

Channel **Channel 1 ***

Sampling Time **480 Cycles ***

Rank **3 ***

Channel **Channel 6 ***

Sampling Time **480 Cycles ***

Rank **4 ***

Channel **Channel 7 ***

Sampling Time	480 Cycles *
Rank	5 *
Channel	Channel 8 *
Sampling Time	480 Cycles *
ADC_Injected_ConversionMode:	
Number Of Conversions	0
WatchDog:	
Enable Analog WatchDog Mode	false

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
TIM Prescaler Selection	Disabled

Power Parameters:

Power Regulator Voltage Scale	Power Regulator Voltage Scale 1
Power Over Drive	Enabled

5.3. SYS

Timebase Source: SysTick

5.4. TIM2

Clock Source : Internal Clock

5.4.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	9000 *
Counter Mode	Up
Counter Period (AutoReload Register - 32 bits value)	4999 *
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	Reset (UG bit from TIMx_EGR)

5.5. TIM3

Clock Source : Internal Clock

5.5.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	9000 *
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	9999 *
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	Reset (UG bit from TIMx_EGR)

5.6. USART1

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

5.7. USART2

Mode: Asynchronous

5.7.1. 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

5.8. USART3

Mode: Asynchronous

5.8.1. 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

* User modified value

6. System Configuration

6.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
ADC1	PA0-WKUP	ADC1_IN0	Analog mode	No pull-up and no pull-down	n/a	
	PA1	ADC1_IN1	Analog mode	No pull-up and no pull-down	n/a	
	PA6	ADC1_IN6	Analog mode	No pull-up and no pull-down	n/a	
	PA7	ADC1_IN7	Analog mode	No pull-up and no pull-down	n/a	
	PB0	ADC1_IN8	Analog mode	No pull-up and no pull-down	n/a	
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	
USART1	PA9	USART1_TX	Alternate Function Push Pull	Pull-up	High *	
	PA10	USART1_RX	Alternate Function Push Pull	Pull-up	High *	
USART2	PA2	USART2_TX	Alternate Function Push Pull	Pull-up	High *	USART_TX
	PA3	USART2_RX	Alternate Function Push Pull	Pull-up	High *	USART_RX
USART3	PC5	USART3_RX	Alternate Function Push Pull	Pull-up	High *	
	PB10	USART3_TX	Alternate Function Push Pull	Pull-up	High *	
Single Mapped Signals	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	TMS
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	TCK
	PB3	SYS_JTDO-SWO	n/a	n/a	n/a	SWO
GPIO	PC13	GPIO_EXTI13	External Event Mode with Rising edge trigger detection *	No pull-up and no pull-down	n/a	B1 [Blue PushButton]
	PA5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LD2 [Green Led]
	PB12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PB13	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PB14	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PB15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PC8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PC9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PC10	GPIO_EXTI10	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	
	PC11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PB4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PB5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	

6.2. DMA configuration

DMA request	Stream	Direction	Priority
ADC1	DMA2_Stream0	Peripheral To Memory	Low

ADC1: DMA2_Stream0 DMA request Settings:

Mode: **Circular ***
Use fifo: **Enable ***
FIFO Threshold: **Half Full ***
Peripheral Increment: Disable
Memory Increment: **Enable ***
Peripheral Data Width: Half Word
Memory Data Width: Half Word
Peripheral Burst Size: Single
Memory Burst Size: Single

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
Debug monitor	true	0	0
System tick timer	true	0	0
RCC global interrupt	true	0	0
TIM2 global interrupt	true	0	0
TIM3 global interrupt	true	0	0
USART1 global interrupt	true	0	0
USART2 global interrupt	true	0	0
USART3 global interrupt	true	0	0
EXTI line[15:10] interrupts	true	0	0
DMA2 stream0 global interrupt	true	0	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
ADC1, ADC2 and ADC3 interrupts	unused		

* User modified value

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32F4
Line	STM32F446
MCU	STM32F446RETx
Datasheet	027107_Rev5

7.2. Parameter Selection

Temperature	25
Vdd	null

8. Software Project

8.1. Project Settings

Name	Value
Project Name	NucleoF446RE_BASE
Project Folder	C:\Users\sohae\Desktop\STM32F446RET6_HAL\NucleoF446RE_BASE
Toolchain / IDE	TrueSTUDIO
Firmware Package Name and Version	STM32Cube FW_F4 V1.11.0

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