1. Description

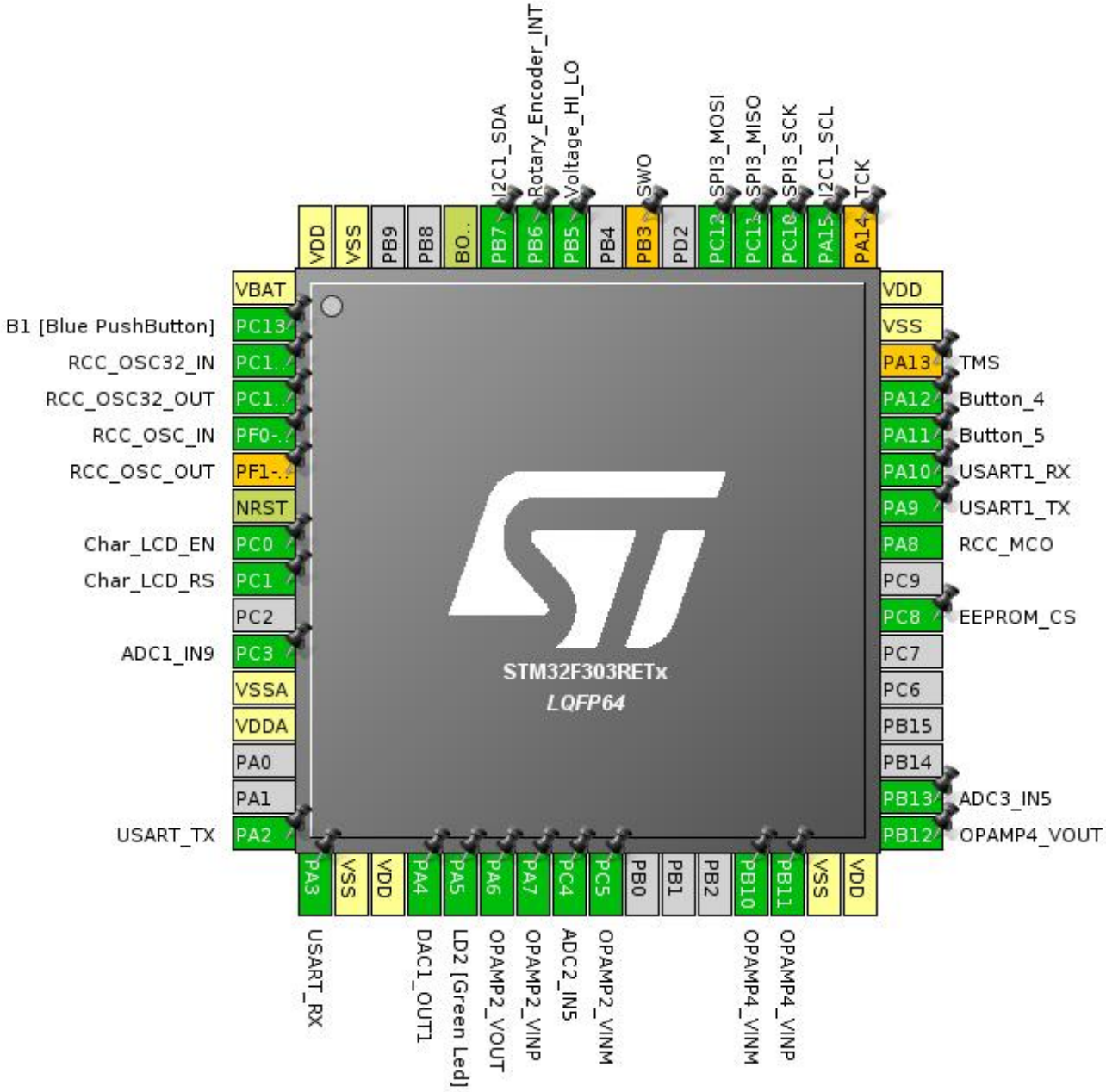
1.1. Project

Project Name	cube
Board Name	NUCLEO-F303RE
Generated with:	STM32CubeMX 4.19.0
Date	03/08/2017

1.2. MCU

MCU Series	STM32F3
MCU Line	STM32F303
MCU name	STM32F303RETx
MCU Package	LQFP64
MCU Pin number	64

2. Pinout Configuration



3. Pins Configuration

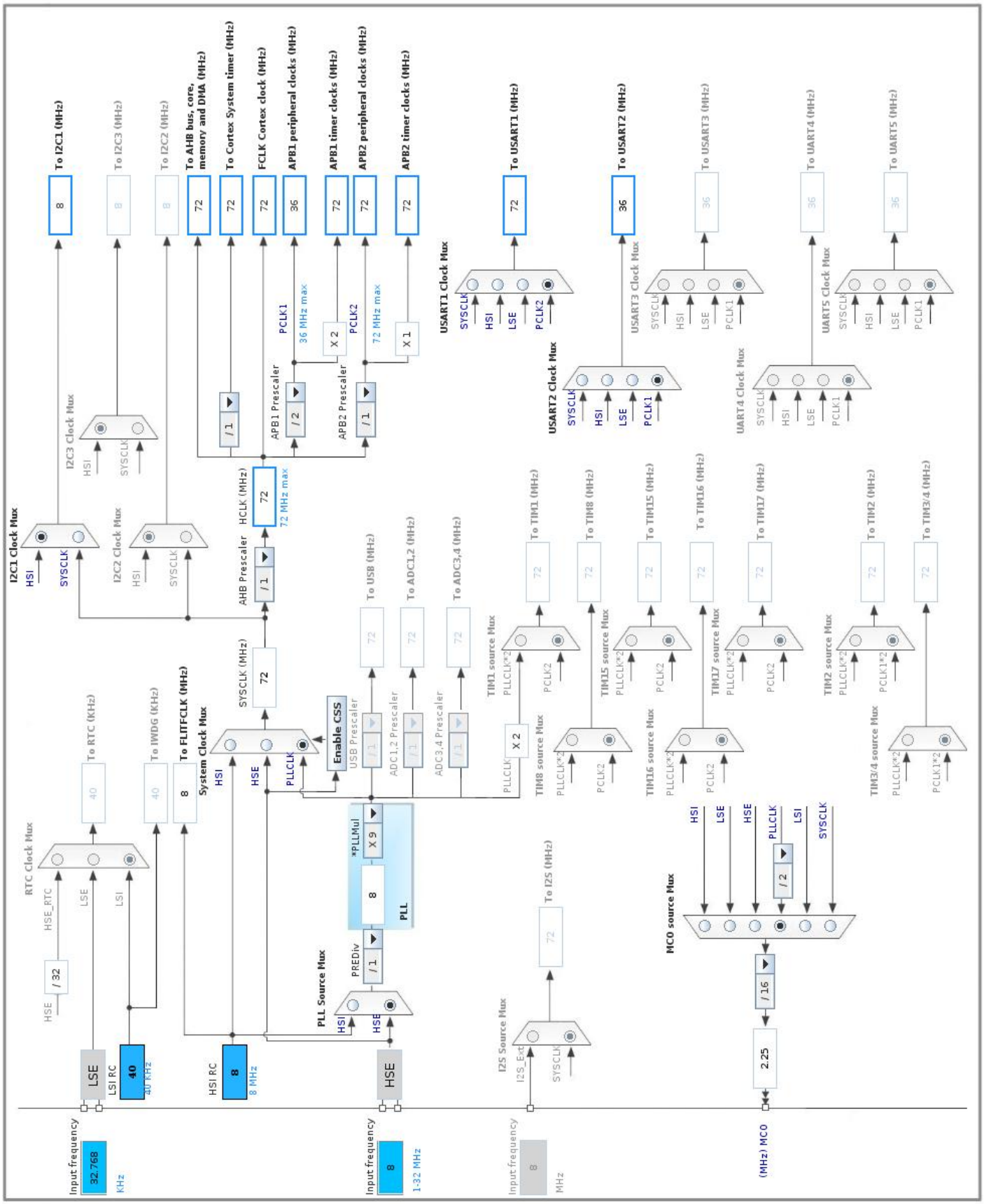
Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
2	PC13	I/O	GPIO_EXTI13	B1 [Blue PushButton]
3	PC14-OSC32_IN	I/O	RCC_OSC32_IN	
4	PC15-OSC32_OUT	I/O	RCC_OSC32_OUT	
5	PF0-OSC_IN	I/O	RCC_OSC_IN	
6	PF1-OSC_OUT *	I/O	RCC_OSC_OUT	
7	NRST	Reset		
8	PC0 **	I/O	GPIO_Output	Char_LCD_EN
9	PC1 **	I/O	GPIO_Output	Char_LCD_RS
11	PC3	I/O	ADC1_IN9	
12	VSSA	Power		
13	VDDA	Power		
16	PA2	I/O	USART2_TX	USART_TX
17	PA3	I/O	USART2_RX	USART_RX
18	VSS	Power		
19	VDD	Power		
20	PA4	I/O	DAC1_OUT1	
21	PA5 **	I/O	GPIO_Output	LD2 [Green Led]
22	PA6	I/O	OPAMP2_VOUT	
23	PA7	I/O	OPAMP2_VINP	
24	PC4	I/O	ADC2_IN5	
25	PC5	I/O	OPAMP2_VINM	
29	PB10	I/O	OPAMP4_VINM	
30	PB11	I/O	OPAMP4_VINP	
31	VSS	Power		
32	VDD	Power		
33	PB12	I/O	OPAMP4_VOUT	
34	PB13	I/O	ADC3_IN5	
39	PC8 **	I/O	GPIO_Output	EEPROM_CS
41	PA8	I/O	RCC_MCO	
42	PA9	I/O	USART1_TX	
43	PA10	I/O	USART1_RX	
44	PA11 **	I/O	GPIO_Input	Button_5
45	PA12 **	I/O	GPIO_Input	Button_4
46	PA13 *	I/O	SYS_JTMS-SWDIO	TMS
47	VSS	Power		

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
48	VDD	Power		
49	PA14 *	I/O	SYS_JTCK-SWCLK	TCK
50	PA15	I/O	I2C1_SCL	
51	PC10	I/O	SPI3_SCK	
52	PC11	I/O	SPI3_MISO	
53	PC12	I/O	SPI3_MOSI	
55	PB3 *	I/O	SYS_JTDO-TRACESWO	SWO
57	PB5 **	I/O	GPIO_Output	Voltage_HI_LO
58	PB6	I/O	GPIO_EXTI6	Rotary_Encoder_INT
59	PB7	I/O	I2C1_SDA	
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: IN9

5.1.1. Parameter Settings:

ADCs_Common_Settings:

Mode	Independent mode

ADC_Settings:

Clock Prescaler	**Synchronous clock mode divided by 1 ***
Resolution	ADC 12-bit resolution
Data Alignment	Right alignment
Scan Conversion Mode	Disabled
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	Disabled
End Of Conversion Selection	End of single conversion
Overrun behaviour	Overrun data overwritten
Low Power Auto Wait	Disabled

ADC_Regular_ConversionMode:

Enable Regular Conversions	Enable
Number Of Conversion	1
External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None
Rank	1
Channel	Channel 9
Sampling Time	1.5 Cycles
Offset Number	No offset
Offset	0

ADC_Injected_ConversionMode:

Enable Injected Conversions	Enable
Number Of Conversions	0

Analog Watchdog 1:

Enable Analog WatchDog1 Mode	false

Analog Watchdog 2:

Enable Analog WatchDog2 Mode	false

Analog Watchdog 3:

Enable Analog WatchDog3 Mode	false

5.2. ADC2

IN5: IN5 Single-ended
mode: VOPAMP2 Channel

5.2.1. Parameter Settings:

ADCs_Common_Settings:

Mode	Independent mode

ADC_Settings:

Clock Prescaler	**Synchronous clock mode divided by 1 ***
Resolution	ADC 12-bit resolution
Data Alignment	Right alignment
Scan Conversion Mode	Disabled
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	Disabled
End Of Conversion Selection	End of single conversion
Overrun behaviour	Overrun data overwritten
Low Power Auto Wait	Disabled

ADC_Regular_ConversionMode:

Enable Regular Conversions	Enable
Number Of Conversion	1
Rank	1
Channel	Channel 5
Sampling Time	1.5 Cycles
Offset Number	No offset
Offset	0

ADC_Injected_ConversionMode:

Enable Injected Conversions	Enable
Number Of Conversions	0

Analog Watchdog 1:

Enable Analog WatchDog1 Mode	false

Analog Watchdog 2:

Enable Analog WatchDog2 Mode	false

Analog Watchdog 3:

Enable Analog WatchDog3 Mode	false

5.3. ADC3

mode: IN5

5.3.1. Parameter Settings:

ADCs_Common_Settings:

Mode	Independent mode

ADC_Settings:

Clock Prescaler	**Synchronous clock mode divided by 1 ***
Resolution	ADC 12-bit resolution
Data Alignment	Right alignment
Scan Conversion Mode	Disabled
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	Disabled
End Of Conversion Selection	End of single conversion
Overrun behaviour	Overrun data overwritten
Low Power Auto Wait	Disabled

ADC_Regular_ConversionMode:

Enable Regular Conversions	Enable
Number Of Conversion	1
External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None
Rank	1
Channel	Channel 5
Sampling Time	1.5 Cycles
Offset Number	No offset
Offset	0

ADC_Injected_ConversionMode:

Enable Injected Conversions	Enable
Number Of Conversions	0

Analog Watchdog 1:

Enable Analog WatchDog1 Mode	false

Analog Watchdog 2:

Enable Analog WatchDog2 Mode	false

Analog Watchdog 3:

Enable Analog WatchDog3 Mode	false

5.4. ADC4

mode: VOPAMP4 Channel

5.4.1. Parameter Settings:

ADCs_Common_Settings:

Mode	Independent mode

ADC_Settings:

Clock Prescaler	**Synchronous clock mode divided by 1 ***
Resolution	ADC 12-bit resolution
Data Alignment	Right alignment
Scan Conversion Mode	Disabled
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	Disabled
End Of Conversion Selection	End of single conversion
Overrun behaviour	Overrun data overwritten
Low Power Auto Wait	Disabled

ADC_Regular_ConversionMode:

Enable Regular Conversions	Enable
Number Of Conversion	1
Rank	1
Channel	Channel Vopamp4
Sampling Time	1.5 Cycles
Offset Number	No offset
Offset	0

ADC_Injected_ConversionMode:

Enable Injected Conversions	Enable
Number Of Conversions	0

Analog Watchdog 1:

Enable Analog WatchDog1 Mode	false

Analog Watchdog 2:

Enable Analog WatchDog2 Mode	false

Analog Watchdog 3:

Enable Analog WatchDog3 Mode	false

5.5. DAC1

mode: OUT1 Configuration

5.5.1. Parameter Settings:

DAC Out1 Settings:

Output Buffer	Enable
Trigger	None

5.6. I2C1

I2C: I2C

5.6.1. Parameter Settings:

Timing configuration:

I2C Speed Mode	Standard Mode
I2C Speed Frequency (KHz)	100
Rise Time (ns)	0
Fall Time (ns)	0
Coefficient of Digital Filter	0
Analog Filter	Enabled
Timing	0x2000090E

Slave Features:

Clock No Stretch Mode	Disabled
General Call Address Detection	Disabled
Primary Address Length selection	7-bit
Dual Address Acknowledged	Disabled
Primary slave address	0

5.7. OPAMP2

Mode: PGA Connected

5.7.1. Parameter Settings:

Basic Parameters:

PGA Gain	2
User Trimming	Disable

5.8. OPAMP4

Mode: PGA Connected

5.8.1. Parameter Settings:

Basic Parameters:

PGA Gain	2
User Trimming	Disable

5.9. RCC

High Speed Clock (HSE): BYPASS Clock Source
Low Speed Clock (LSE) : Crystal/Ceramic Resonator
mode: Master Clock Output

5.9.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Prefetch Buffer	Enabled
Flash Latency(WS)	2 WS (3 CPU cycle)

RCC Parameters:

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

5.10. SPI3

Mode: Full-Duplex Master

5.10.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	**8 Bits ***
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	**4 ***
Baud Rate	**9.0 MBits/s ***
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSSP Mode	**Disabled ***
NSS Signal Type	Software

5.11. SYS

Timebase Source: SysTick

5.12. USART1

Mode: Asynchronous

5.12.1. 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	Enable

DMA on RX Error	Enable
MSB First	Disable

5.13. USART2

Mode: Asynchronous

5.13.1. 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	Enable
DMA on RX Error	Enable
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
ADC1	PC3	ADC1_IN9	Analog mode	No pull up pull down	n/a	
ADC2	PC4	ADC2_IN5	Analog mode	No pull up pull down	n/a	
ADC3	PB13	ADC3_IN5	Analog mode	No pull up pull down	n/a	
DAC1	PA4	DAC1_OUT1	Analog mode	No pull up pull down	n/a	
I2C1	PA15	I2C1_SCL	Alternate Function Open Drain	Pull up	**High ***	
	PB7	I2C1_SDA	Alternate Function Open Drain	Pull up	**High ***	
OPAMP2	PA6	OPAMP2_VOUT	Analog mode	No pull up pull down	n/a	
	PA7	OPAMP2_VINP	Analog mode	No pull up pull down	n/a	
	PC5	OPAMP2_VINM	Analog mode	No pull up pull down	n/a	
OPAMP4	PB10	OPAMP4_VINM	Analog mode	No pull up pull down	n/a	
	PB11	OPAMP4_VINP	Analog mode	No pull up pull down	n/a	
	PB12	OPAMP4_VOUT	Analog mode	No pull up 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	
	PF0-OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	
	PA8	RCC_MCO	Alternate Function Push Pull	No pull up pull down	Low	
SPI3	PC10	SPI3_SCK	Alternate Function Push Pull	No pull up pull down	**High ***	
	PC11	SPI3_MISO	Alternate Function Push Pull	No pull up pull down	**High ***	
	PC12	SPI3_MOSI	Alternate Function Push Pull	No pull up pull down	**High ***	
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	*	Low	USART_TX
	PA3	USART2_RX	Alternate Function Push Pull	*	Low	USART_RX
Single Mapped Signals	PF1-OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	
	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	TMS
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	TCK

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PB3	SYS_JTDO-TRACESWO	n/a	n/a	n/a	SWO
GPIO	PC13	GPIO_EXTI13	**External Interrupt Mode with Falling edge trigger detection**	No pull up pull down	n/a	B1 [Blue PushButton]
	PC0	GPIO_Output	Output Push Pull	No pull up pull down	**High ***	Char_LCD_EN
	PC1	GPIO_Output	Output Push Pull	No pull up pull down	**High ***	Char_LCD_RS
	PA5	GPIO_Output	Output Push Pull	No pull up pull down	**High ***	LD2 [Green Led]
	PC8	GPIO_Output	Output Push Pull	No pull up pull down	**High ***	EEPROM_CS
	PA11	GPIO_Input	Input mode	**Pull up ***	**n/a**	Button_5
	PA12	GPIO_Input	Input mode	**Pull up ***	**n/a**	Button_4
	PB5	GPIO_Output	Output Push Pull	No pull up pull down	**High ***	Voltage_HI_LO
	PB6	GPIO_EXTI6	**External Interrupt Mode with Falling edge trigger detection**	**Pull up ***	**n/a**	Rotary_Encoder_INT

6.2. DMA configuration

DMA request	Stream	Direction	Priority
USART2_TX	DMA1_Channel7	Memory To Peripheral	Low
USART1_RX	DMA1_Channel5	Peripheral To Memory	**High ***
USART1_TX	DMA1_Channel4	Memory To Peripheral	Low
USART2_RX	DMA1_Channel6	Peripheral To Memory	Low

USART2_TX: DMA1_Channel7 DMA request Settings:

Mode:	Normal
Peripheral Increment:	Disable
Memory Increment:	**Enable ***
Peripheral Data Width:	Byte
Memory Data Width:	Byte

USART1_RX: DMA1_Channel5 DMA request Settings:

Mode:	**Circular ***
Peripheral Increment:	Disable
Memory Increment:	**Enable ***
Peripheral Data Width:	Byte
Memory Data Width:	Byte

USART1_TX: DMA1_Channel4 DMA request Settings:

Mode:	Normal
Peripheral Increment:	Disable
Memory Increment:	**Enable ***
Peripheral Data Width:	Byte
Memory Data Width:	Byte

USART2_RX: DMA1_Channel6 DMA request Settings:

Mode:	**Circular ***
Peripheral Increment:	Disable
Memory Increment:	**Enable ***
Peripheral Data Width:	Byte

Memory Data Width: Byte

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
DMA1 channel4 global interrupt	true	0	0
DMA1 channel5 global interrupt	true	0	0
DMA1 channel6 global interrupt	true	0	0
DMA1 channel7 global interrupt	true	0	0
EXTI line[9:5] interrupts	true	0	0
USART1 global interrupt / USART1 wake-up interrupt through EXTI line 25	true	0	0
USART2 global interrupt / USART2 wake-up interrupt through EXTI line 26	true	0	0
SPI3 global interrupt	true	0	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
ADC1 and ADC2 interrupts	unused		
I2C1 event global interrupt / I2C1 wake-up interrupt through EXTI line 23	unused		
I2C1 error interrupt	unused		
EXTI line[15:10] interrupts	unused		
ADC3 global interrupt	unused		
TIM6 global interrupt and DAC1 underrun interrupt	unused		
ADC4 interrupt	unused		
Floating point unit interrupt	unused		

*** User modified value**

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32F3
Line	STM32F303
MCU	STM32F303RETx
Datasheet	026415_Rev4

7.2. Parameter Selection

Temperature	25
Vdd	3.6

8. Software Project

8.1. Project Settings

Name	Value
Project Name	cube
Project Folder	/home/harald/git/Power_Supply/cube
Toolchain / IDE	Other Toolchains (GPDSC)
Firmware Package Name and Version	STM32Cube FW_F3 V1.7.0

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	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