

1. Description

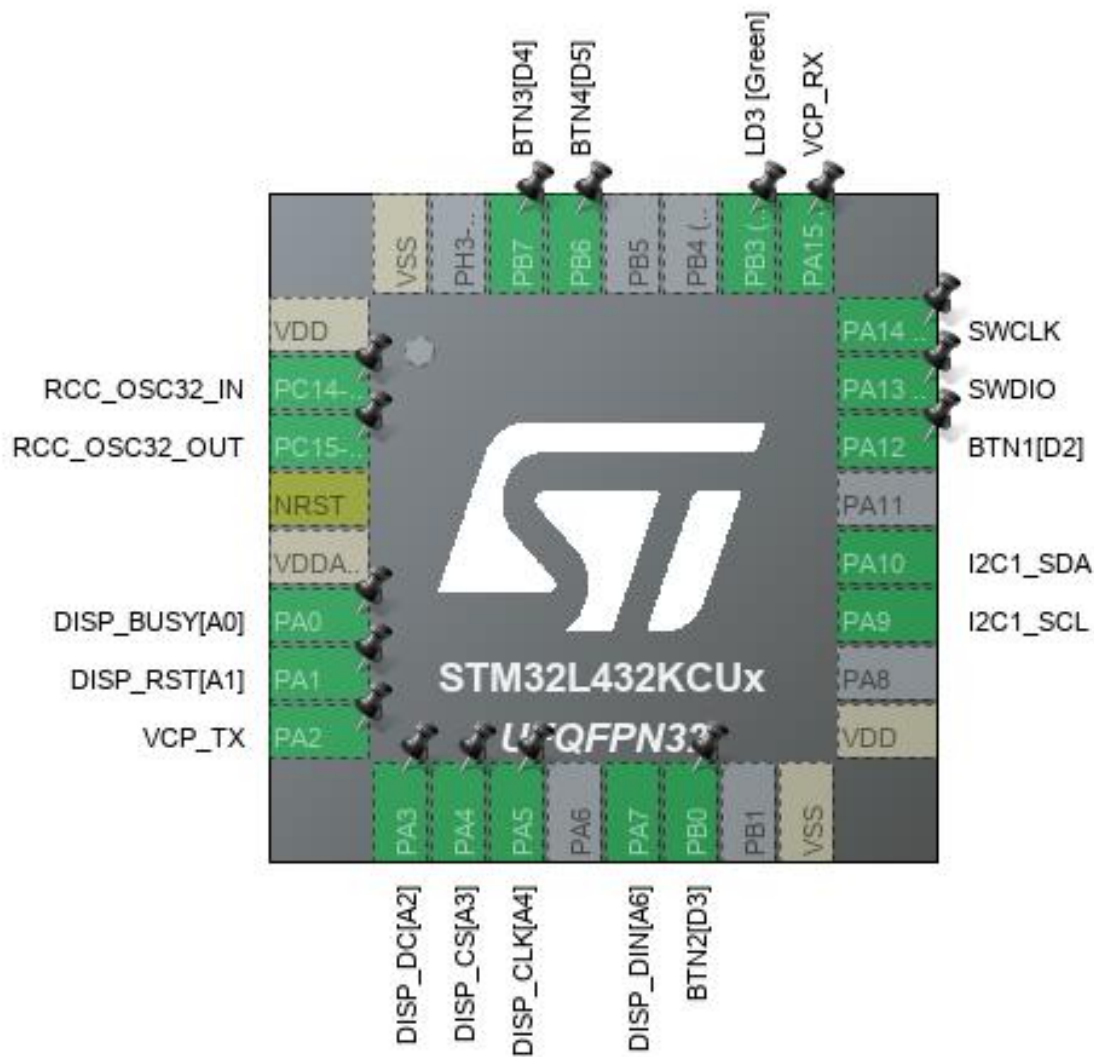
1.1. Project

Project Name	stm32l4-barograph
Board Name	NUCLEO-L432KC
Generated with:	STM32CubeMX 5.6.1
Date	05/13/2020

1.2. MCU

MCU Series	STM32L4
MCU Line	STM32L4x2
MCU name	STM32L432KCUx
MCU Package	UFQFPN32
MCU Pin number	32

2. Pinout Configuration

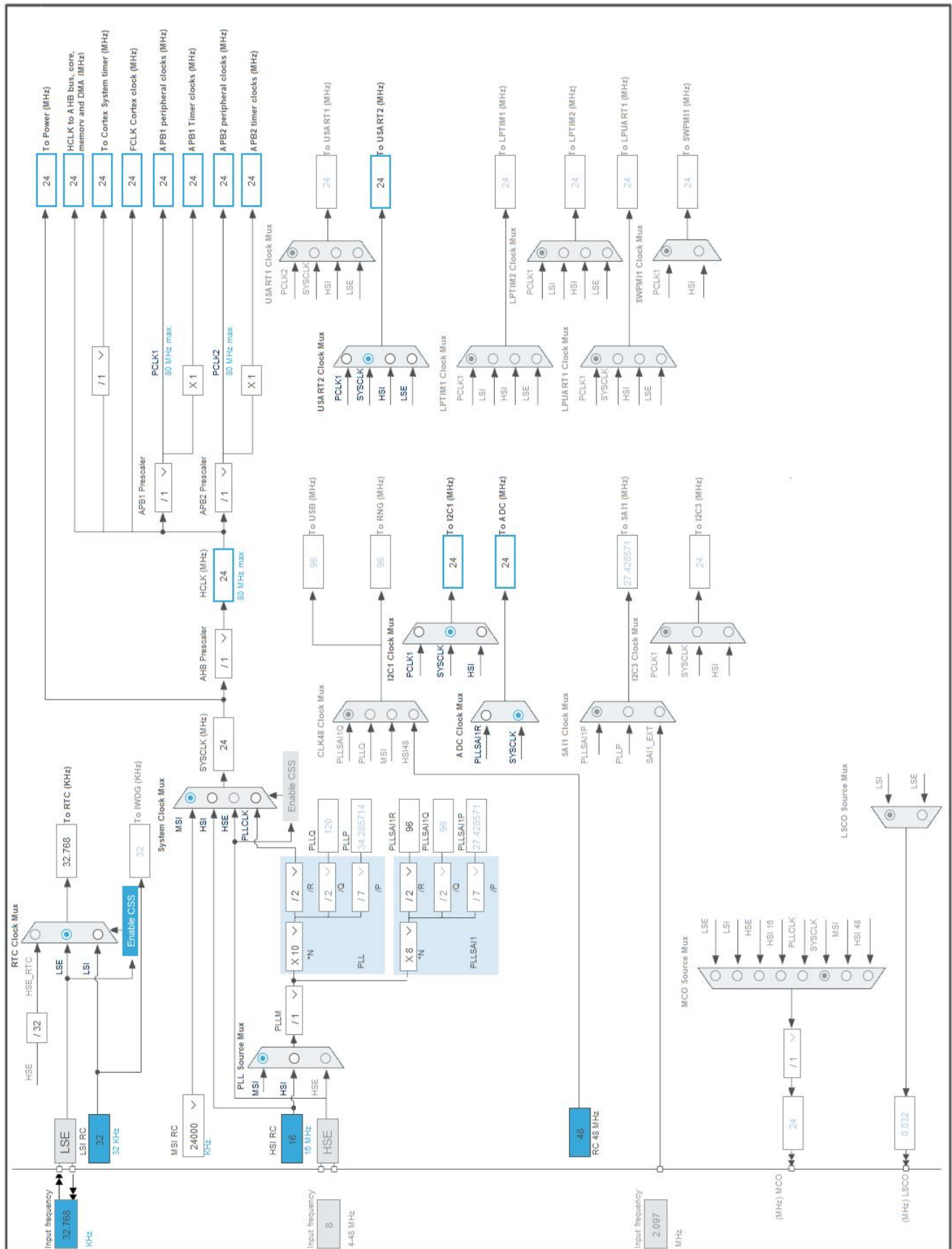


3. Pins Configuration

Pin Number UFQFPN32	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VDD	Power		
2	PC14-OSC32_IN (PC14)	I/O	RCC_OSC32_IN	
3	PC15-OSC32_OUT (PC15)	I/O	RCC_OSC32_OUT	
4	NRST	Reset		
5	VDDA/VREF+	Power		
6	PA0 *	I/O	GPIO_Input	DISP_BUSY[A0]
7	PA1 *	I/O	GPIO_Output	DISP_RST[A1]
8	PA2	I/O	USART2_TX	VCP_TX
9	PA3 *	I/O	GPIO_Output	DISP_DC[A2]
10	PA4 *	I/O	GPIO_Output	DISP_CS[A3]
11	PA5	I/O	SPI1_SCK	DISP_CLK[A4]
13	PA7	I/O	SPI1_MOSI	DISP_DIN[A6]
14	PB0 *	I/O	GPIO_Input	BTN2[D3]
16	VSS	Power		
17	VDD	Power		
19	PA9	I/O	I2C1_SCL	
20	PA10	I/O	I2C1_SDA	
22	PA12 *	I/O	GPIO_Input	BTN1[D2]
23	PA13 (JTMS-SWDIO)	I/O	SYS_JTMS-SWDIO	SWDIO
24	PA14 (JTCK-SWCLK)	I/O	SYS_JTCK-SWCLK	SWCLK
25	PA15 (JTDI)	I/O	USART2_RX	VCP_RX
26	PB3 (JTDO-TRACESWO) *	I/O	GPIO_Output	LD3 [Green]
29	PB6 *	I/O	GPIO_Input	BTN4[D5]
30	PB7 *	I/O	GPIO_Input	BTN3[D4]
32	VSS	Power		

* The pin is affected with an I/O function

4. Clock Tree Configuration



5. Software Project

5.1. Project Settings

Name	Value
Project Name	stm32l4-barograph
Project Folder	C:\work\arduino-to-clion\stm32l4-barograph
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_L4 V1.15.1

5.2. Code Generation Settings

Name	Value
STM32Cube MCU packages and embedded software	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)	Yes

6. Power Consumption Calculator report

6.1. Microcontroller Selection

Series	STM32L4
Line	STM32L4x2
MCU	STM32L432KCUx
Datasheet	028798_Rev2

6.2. Parameter Selection

Temperature	25
Vdd	3.0

6.3. Battery Selection

Battery	Li-SOCL2(A3400)
Capacity	3400.0 mAh
Self Discharge	0.08 %/month
Nominal Voltage	3.6 V
Max Cont Current	100.0 mA
Max Pulse Current	200.0 mA
Cells in series	1
Cells in parallel	1

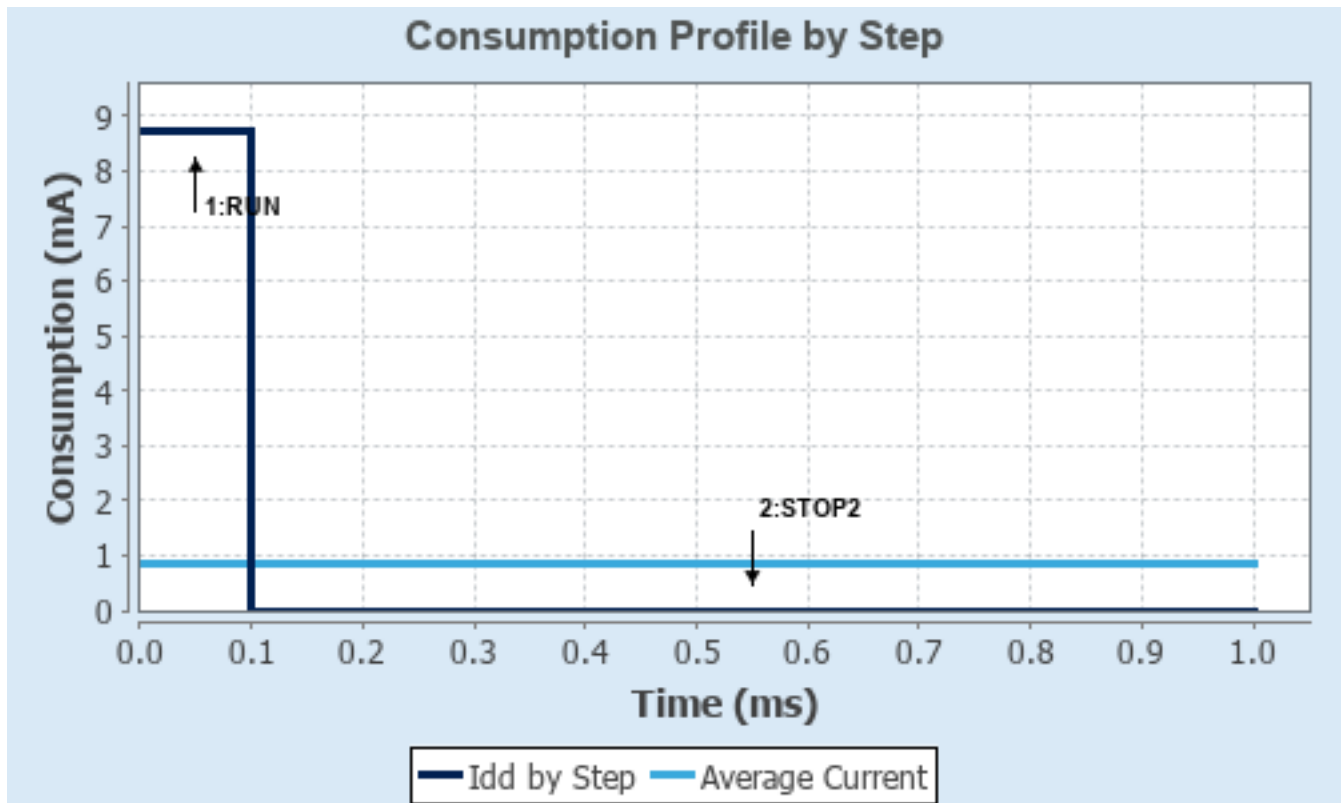
6.4. Sequence

Step	Step1	Step2
Mode	RUN	STOP2
Vdd	3.0	3.0
Voltage Source	Battery	Battery
Range	Range1-High	NoRange
Fetch Type	SRAM2	n/a
CPU Frequency	80 MHz	0 Hz
Clock Configuration	HSE BYP PLL	ALL CLOCKS OFF
Clock Source Frequency	4 MHz	0 Hz
Peripherals		
Additional Cons.	0 mA	0 mA
Average Current	8.71 mA	1.06 μ A
Duration	0.1 ms	0.9 ms
DMIPS	100.0	0.0
Ta Max	103.98	105
Category	In DS Table	In DS Table

6.5. RESULTS

Sequence Time	1 ms	Average Current	871.95 μ A
Battery Life	5 months, 9 days, 16 hours	Average DMIPS	100.0 DMIPS

6.6. Chart



7. IPs and Middleware Configuration

7.1. ADC1

mode: Vrefint Channel

7.1.1. Parameter Settings:

ADC_Settings:

Clock Prescaler	Asynchronous 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	Enabled *

ADC_Regular_ConversionMode:

Enable Regular Conversions	Enable
Enable Regular Oversampling	Disable
Number Of Conversion	1
External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None
Rank	1
Channel	Channel Vrefint
Sampling Time	640.5 Cycles *
Offset Number	No offset

ADC_Injected_ConversionMode:

Enable Injected Conversions	Disable
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Analog Watchdog 1:

Enable Analog WatchDog1 Mode	false
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Analog Watchdog 2:

Enable Analog WatchDog2 Mode	false
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Analog Watchdog 3:

Enable Analog WatchDog3 Mode	false
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7.2. GPIO

7.3. I2C1

I2C: I2C

7.3.1. Parameter Settings:

Timing configuration:

Custom Timing	Disabled
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	0x00506682 *

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

7.4. RCC

Low Speed Clock (LSE) : Crystal/Ceramic Resonator

7.4.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Disabled
Data Cache	Enabled
Flash Latency(WS)	4 WS (5 CPU cycle)

RCC Parameters:

HSI Calibration Value	16
MSI Calibration Value	0
MSI Auto Calibration	Enabled
HSE Startup Timeout Value (ms)	100
LSE Startup Timeout Value (ms)	5000
LSE Drive Capability	LSE oscillator low drive capability

Power Parameters:

Power Regulator Voltage Scale

Power Regulator Voltage Scale 2 *

7.5. RTC

mode: Activate Clock Source

mode: WakeUp

7.5.1. Parameter Settings:

General:

Hour Format	Hourformat 24
Asynchronous Predivider value	127
Synchronous Predivider value	255

Wake UP:

Wake Up Clock	1 Hz *
Wake Up Counter	1800 *

7.6. SPI1

Mode: Transmit Only Master

7.6.1. Parameter Settings:

Basic Parameters:

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

Clock Parameters:

Prescaler (for Baud Rate)	2
Baud Rate	12.0 MBits/s *
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSSP Mode	Enabled
NSS Signal Type	Software

7.7. SYS

Debug: Serial Wire

Timebase Source: SysTick

7.8. USART2

Mode: Asynchronous

7.8.1. 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
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

8. System Configuration

8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
I2C1	PA9	I2C1_SCL	Alternate Function Open Drain	Pull-up	Very High *	
	PA10	I2C1_SDA	Alternate Function Open Drain	Pull-up	Very High *	
RCC	PC14-OSC32_IN (PC14)	RCC_OSC32_IN	n/a	n/a	n/a	
	PC15-OSC32_OUT (PC15)	RCC_OSC32_OUT	n/a	n/a	n/a	
SPI1	PA5	SPI1_SCK	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	DISP_CLK[A4]
	PA7	SPI1_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	DISP_DIN[A6]
SYS	PA13 (JTMS-SWDIO)	SYS_JTMS-SWDIO	n/a	n/a	n/a	SWDIO
	PA14 (JTCK-SWCLK)	SYS_JTCK-SWCLK	n/a	n/a	n/a	SWCLK
USART2	PA2	USART2_TX	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	VCP_TX
	PA15 (JTDI)	USART2_RX	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	VCP_RX
GPIO	PA0	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	DISP_BUSY[A0]
	PA1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Very High *	DISP_RST[A1]
	PA3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Very High *	DISP_DC[A2]
	PA4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Very High *	DISP_CS[A3]
	PB0	GPIO_Input	Input mode	Pull-up *	n/a	BTN2[D3]
	PA12	GPIO_Input	Input mode	Pull-up *	n/a	BTN1[D2]
	PB3 (JTDO-TRACESWO)	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LD3 [Green]

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PB6	GPIO_Input	Input mode	Pull-up *	n/a	BTN4[D5]
	PB7	GPIO_Input	Input mode	Pull-up *	n/a	BTN3[D4]

8.2. DMA configuration

DMA request	Stream	Direction	Priority
SPI1_TX	DMA1_Channel3	Memory To Peripheral	Low

SPI1_TX: DMA1_Channel3 DMA request Settings:

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

8.3. 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
RTC wake-up interrupt through EXTI line 20	true	0	0
DMA1 channel3 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		
ADC1 global interrupt	unused		
I2C1 event interrupt	unused		
I2C1 error interrupt	unused		
SPI1 global interrupt	unused		
USART2 global interrupt	unused		
FPU global interrupt	unused		

* User modified value

9. Predefined Views - Category view : Current

Middleware

System Core

Analog

Timers

Connectivity

Multimedia

Security

Computing

DMA ✓

ADC1 ✓

RTC ✓

I2C1 ✓

GPIO ✓

SPI1 ✓

NVIC ✓

USART2 ✓

RCC ✓

SYS ✓

10. Software Pack Report