1. Description

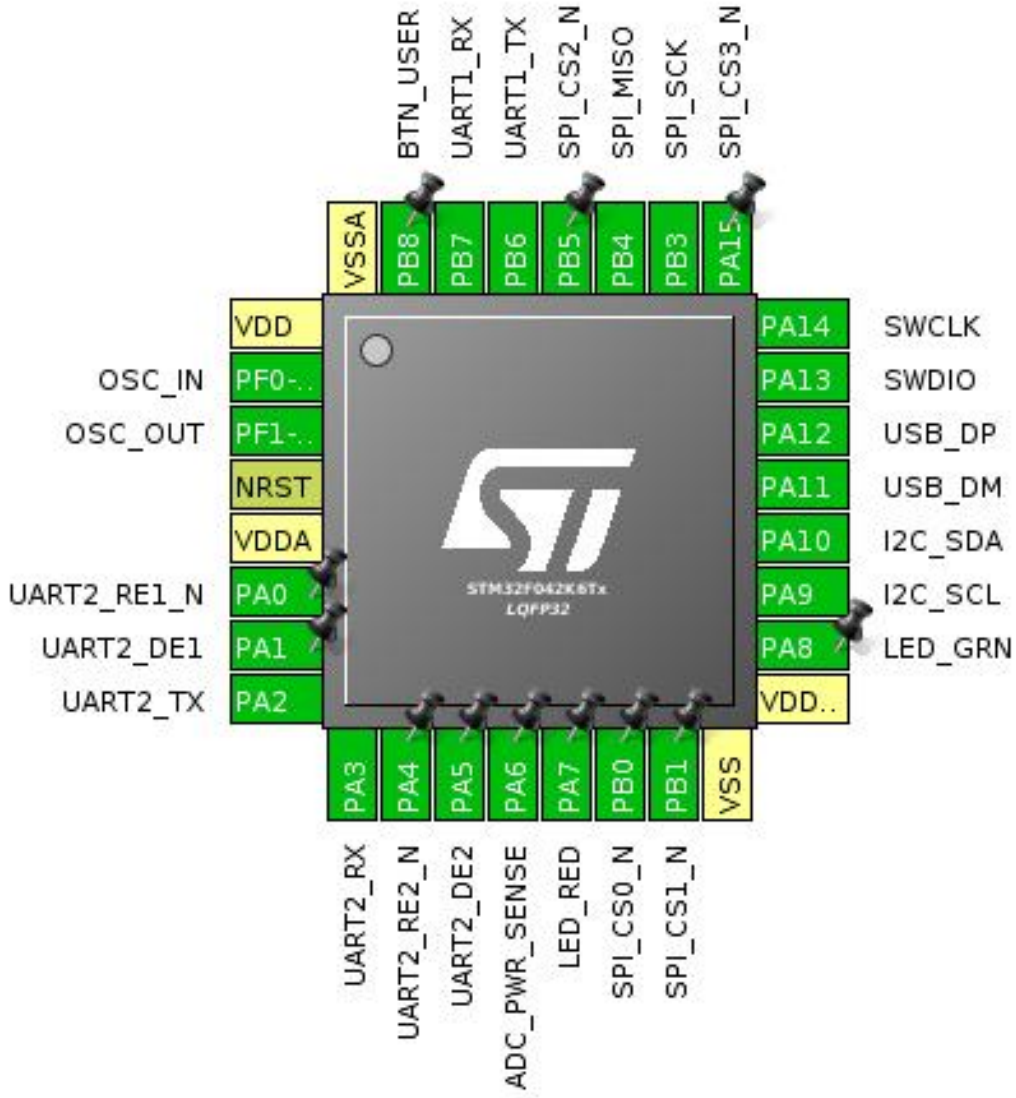
1.1. Project

Project Name	thermocouple_F042K6
Board Name	custom
Generated with:	STM32CubeMX 4.26.1
Date	01/07/2019

1.2. MCU

MCU Series	STM32F0
MCU Line	STM32F0x2
MCU name	STM32F042K6Tx
MCU Package	LQFP32
MCU Pin number	32

2. Pinout Configuration

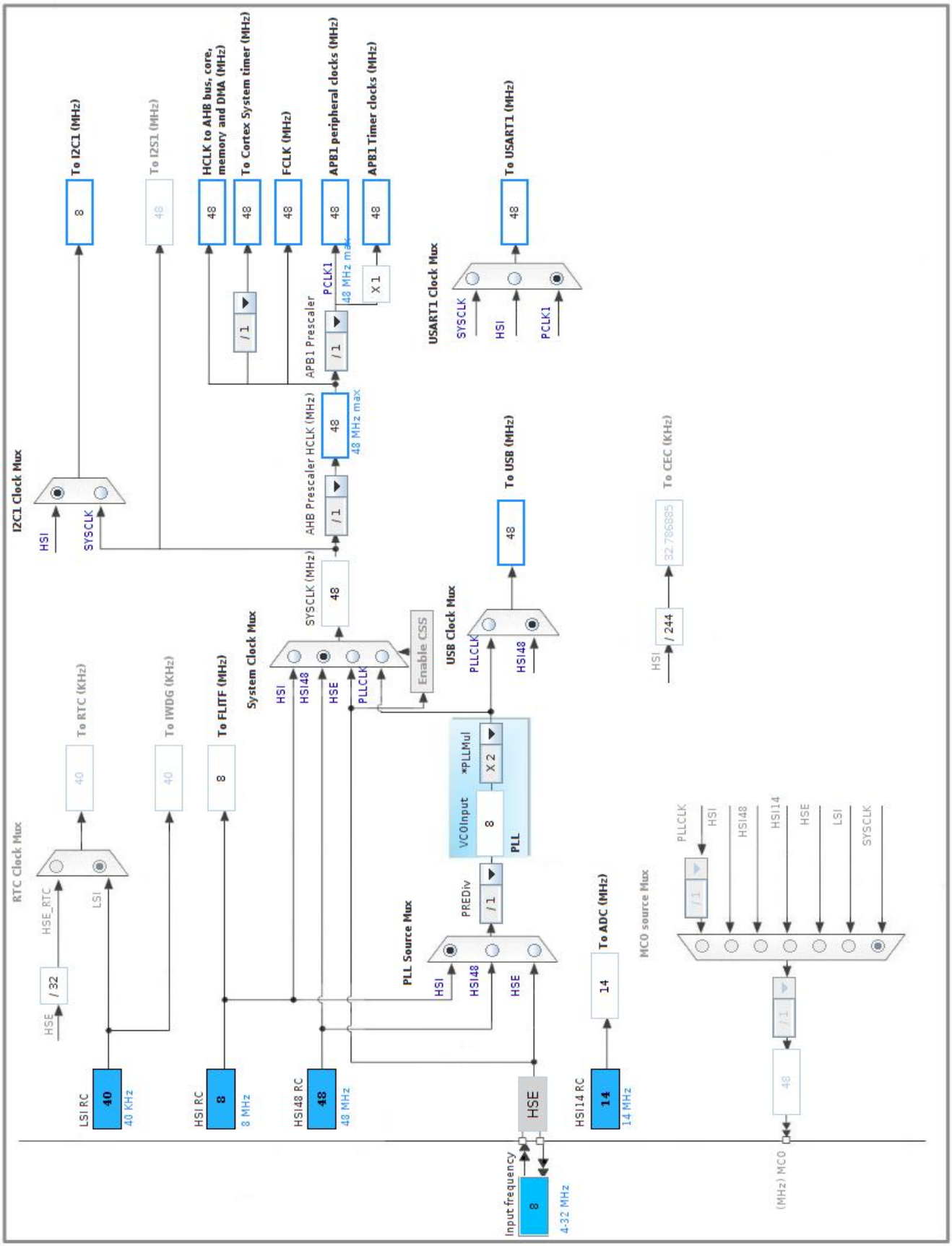


3. Pins Configuration

Pin Number LQFP32	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VDD	Power		
2	PF0-OSC_IN	I/O	RCC_OSC_IN	OSC_IN
3	PF1-OSC_OUT	I/O	RCC_OSC_OUT	OSC_OUT
4	NRST	Reset		
5	VDDA	Power		
6	PA0 *	I/O	GPIO_Output	UART2_RE1_N
7	PA1 *	I/O	GPIO_Output	UART2_DE1
8	PA2	I/O	USART2_TX	UART2_TX
9	PA3	I/O	USART2_RX	UART2_RX
10	PA4 *	I/O	GPIO_Output	UART2_RE2_N
11	PA5 *	I/O	GPIO_Output	UART2_DE2
12	PA6	I/O	ADC_IN6	ADC_PWR_SENSE
13	PA7 *	I/O	GPIO_Output	LED_RED
14	PB0 *	I/O	GPIO_Output	SPI_CS0_N
15	PB1 *	I/O	GPIO_Output	SPI_CS1_N
16	VSS	Power		
17	VDDIO2	Power		
18	PA8 *	I/O	GPIO_Output	LED_GRN
19	PA9	I/O	I2C1_SCL	I2C_SCL
20	PA10	I/O	I2C1_SDA	I2C_SDA
21	PA11	I/O	USB_DM	USB_DM
22	PA12	I/O	USB_DP	USB_DP
23	PA13	I/O	SYS_SWDIO	SWDIO
24	PA14	I/O	SYS_SWCLK	SWCLK
25	PA15 *	I/O	GPIO_Output	SPI_CS3_N
26	PB3	I/O	SPI1_SCK	SPI_SCK
27	PB4	I/O	SPI1_MISO	SPI_MISO
28	PB5 *	I/O	GPIO_Output	SPI_CS2_N
29	PB6	I/O	USART1_TX	UART1_TX
30	PB7	I/O	USART1_RX	UART1_RX
31	PB8 *	I/O	GPIO_Input	BTN_USER
32	VSSA	Power		

* The pin is affected with an I/O function

4. Clock Tree Configuration



5. IPs and Middleware Configuration

5.1. ADC

mode: IN6

5.1.1. Parameter Settings:

ADC_Settings:

Clock Prescaler	Asynchronous clock mode
Resolution	ADC 12-bit resolution
Data Alignment	Right alignment
Scan Conversion Mode	Forward
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	Disabled
End Of Conversion Selection	End of single conversion
Overrun behaviour	Overrun data preserved
Low Power Auto Wait	Disabled
Low Power Auto Power Off	Disabled

ADC_Regular_ConversionMode:

Sampling Time	**55.5 Cycles ***
External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None

WatchDog:

Enable Analog WatchDog Mode	false

5.2. I2C1

I2C: I2C

5.2.1. 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

5.3. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

5.3.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Prefetch Buffer	Enabled
Flash Latency(WS)	1 WS (2 CPU cycle)

RCC Parameters:

HSI Calibration Value	16
HSI14 Calibration Value	16
HSE Startup Timout Value (ms)	100
LSE Startup Timout Value (ms)	5000

5.4. SPI1

Mode: Receive Only Master

5.4.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	**16 Bits ***
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	**256 ***
Baud Rate	**187.5 KBits/s ***
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSSP Mode	Enabled
NSS Signal Type	Software

5.5. SYS

mode: Debug Serial Wire

Timebase Source: SysTick

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
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

5.7. 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
Single Sample	Disable

Advanced Features:

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

5.8. USB

mode: Device (FS)

5.8.1. Parameter Settings:

Basic Parameters:

Speed	Full Speed 12MBit/s
Endpoint 0 Max Packet size	64 Bytes
Physical interface	Internal Phy

Power Parameters:

Low Power	Disabled
Link Power Management	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
ADC	PA6	ADC_IN6	Analog mode	No pull-up and no pull-down	n/a	ADC_PWR_SENSE
I2C1	PA9	I2C1_SCL	Alternate Function Open Drain	Pull-up	**High ***	I2C_SCL
	PA10	I2C1_SDA	Alternate Function Open Drain	Pull-up	**High ***	I2C_SDA
RCC	PF0-OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	OSC_IN
	PF1-OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	OSC_OUT
SPI1	PB3	SPI1_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	SPI_SCK
	PB4	SPI1_MISO	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	SPI_MISO
SYS	PA13	SYS_SWDIO	n/a	n/a	n/a	SWDIO
	PA14	SYS_SWCLK	n/a	n/a	n/a	SWCLK
USART1	PB6	USART1_TX	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	UART1_TX
	PB7	USART1_RX	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	UART1_RX
USART2	PA2	USART2_TX	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	UART2_TX
	PA3	USART2_RX	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	UART2_RX
USB	PA11	USB_DM	n/a	n/a	n/a	USB_DM
	PA12	USB_DP	n/a	n/a	n/a	USB_DP
GPIO	PA0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Medium ***	UART2_RE1_N
	PA1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Medium ***	UART2_DE1
	PA4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Medium ***	UART2_RE2_N
	PA5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Medium ***	UART2_DE2
	PA7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_RED
	PB0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Medium ***	SPI_CS0_N
	PB1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Medium ***	SPI_CS1_N
	PA8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_GRN
	PA15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Medium ***	SPI_CS3_N
	PB5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Medium ***	SPI_CS2_N
	PB8	GPIO_Input	Input mode	No pull-up and no pull-down	**n/a**	BTN_USER

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
System service call via SWI instruction	true	0	0
Pendable request for system service	true	0	0
System tick timer	true	0	0
USART1 global interrupt / USART1 wake-up interrupt through EXTI line 25	true	0	0
USART2 global interrupt	true	0	0
PVD and VDDIO2 supply comparator interrupts through EXTI lines 16 and 31	unused		
Flash global interrupt	unused		
RCC and CRS global interrupts	unused		
ADC interrupt	unused		
I2C1 event global interrupt / I2C1 wake-up interrupt through EXTI line 23	unused		
SPI1 global interrupt	unused		
USB global Interrupt / USB wake-up interrupt through EXTI line 18	unused		

*** User modified value**

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32F0
Line	STM32F0x2
MCU	STM32F042K6Tx
Datasheet	025832_Rev5

7.2. Parameter Selection

Temperature	25
Vdd	3.6

8. Software Pack Report

9. Software Project

9.1. Project Settings

Name	Value
Project Name	thermocouple_F042K6
Project Folder	/home/john/code/stm32/thermocouple_cubemx/thermocouple_F042K6
Toolchain / IDE	SW4STM32
Firmware Package Name and Version	STM32Cube FW_F0 V1.9.0

9.2. 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	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