

# STM32 CubeMX

## 1. Description

### 1.1. Project

Project Name	cc1200_spi_ripper
Board Name	NUCLEO-H723ZG
Generated with:	STM32CubeMX 6.4.0
Date	02/05/2022

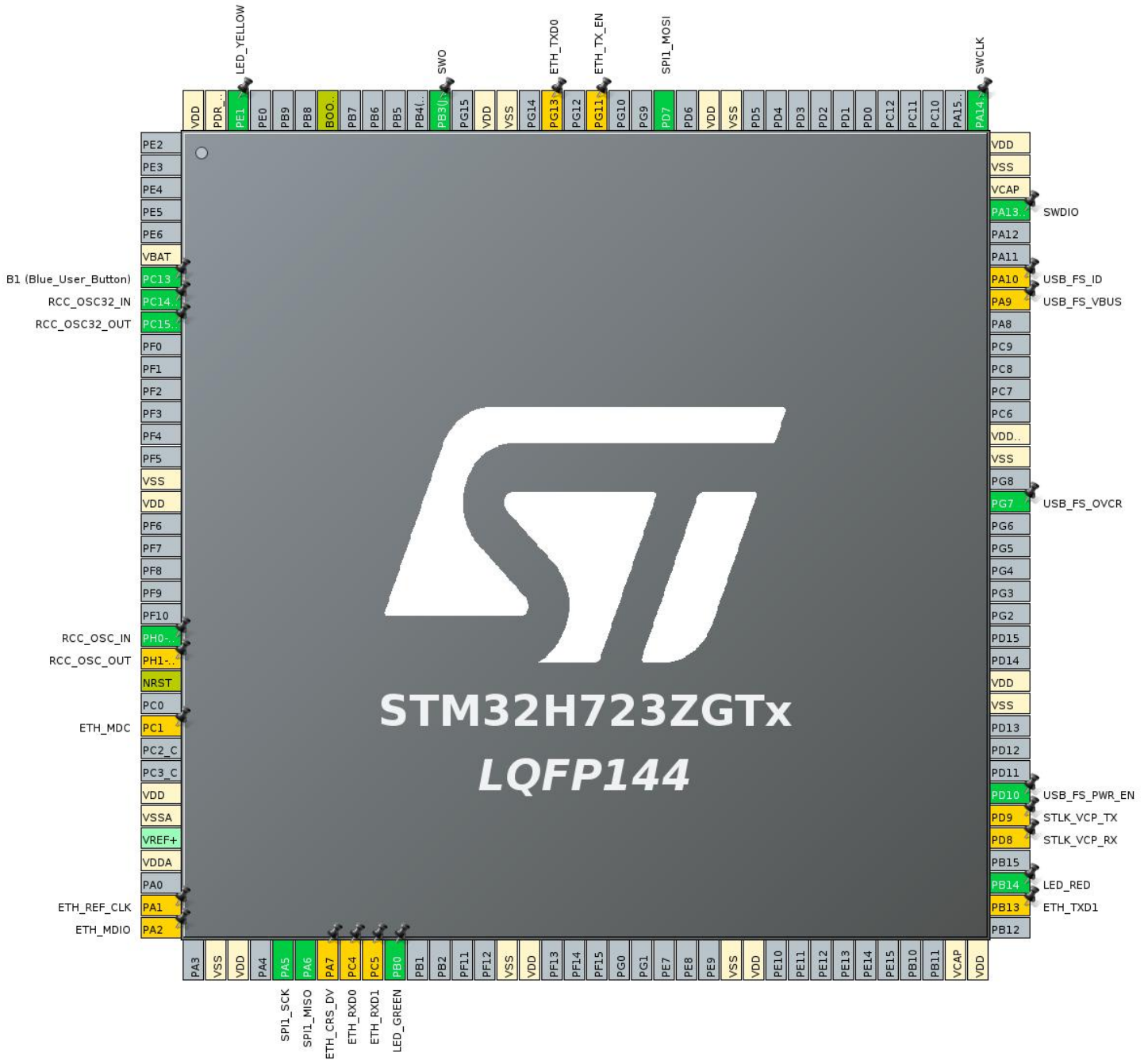
### 1.2. MCU

MCU Series	STM32H7
MCU Line	STM32H723/733
MCU name	STM32H723ZGTx
MCU Package	LQFP144
MCU Pin number	144

### 1.3. Core(s) information

Core(s)	Arm Cortex-M7
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## 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_Input	B1 (Blue_User_Button)
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	
24	PH1-OSC_OUT **	I/O	RCC_OSC_OUT	
25	NRST	Reset		
27	PC1 **	I/O	ETH_MDC	
30	VDD	Power		
31	VSSA	Power		
33	VDDA	Power		
35	PA1 **	I/O	ETH_REF_CLK	
36	PA2 **	I/O	ETH_MDIO	
38	VSS	Power		
39	VDD	Power		
41	PA5	I/O	SPI1_SCK	
42	PA6	I/O	SPI1_MISO	
43	PA7 **	I/O	ETH_CRSDV	
44	PC4 **	I/O	ETH_RXD0	
45	PC5 **	I/O	ETH_RXD1	
46	PB0 *	I/O	GPIO_Output	LED_GREEN
51	VSS	Power		
52	VDD	Power		
61	VSS	Power		
62	VDD	Power		
71	VCAP	Power		
72	VDD	Power		
74	PB13 **	I/O	ETH_TXD1	
75	PB14 *	I/O	GPIO_Output	LED_RED
77	PD8 **	I/O	USART3_TX	STLK_VCP_RX
78	PD9 **	I/O	USART3_RX	STLK_VCP_TX
79	PD10 *	I/O	GPIO_Output	USB_FS_PWR_EN
83	VSS	Power		
84	VDD	Power		

Pin Number LQFP144	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
92	PG7	I/O	GPIO_EXTI7	USB_FS_OVCR
94	VSS	Power		
95	VDD33USB	Power		
101	PA9 **	I/O	USB_OTG_HS_VBUS	USB_FS_VBUS
102	PA10 **	I/O	USB_OTG_HS_ID	USB_FS_ID
105	PA13(JTMS/SWDIO)	I/O	DEBUG_JTMS-SWDIO	SWDIO
106	VCAP	Power		
107	VSS	Power		
108	VDD	Power		
109	PA14(JTCK/SWCLK)	I/O	DEBUG_JTCK-SWCLK	SWCLK
120	VSS	Power		
121	VDD	Power		
123	PD7	I/O	SPI1_MOSI	
126	PG11 **	I/O	ETH_TX_EN	
128	PG13 **	I/O	ETH_TXD0	
130	VSS	Power		
131	VDD	Power		
133	PB3(JTDO/TRACESWO)	I/O	DEBUG_JTDO-SWO	SWO
138	BOOT0	Boot		
142	PE1 *	I/O	GPIO_Output	LED_YELLOW
143	PDR_ON	Power		
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



## 5. Software Project

### 5.1. Project Settings

Name	Value
Project Name	cc1200_spi_ripper
Project Folder	/home/curiousmuch/STM32CubeIDE/workspace_1.8.0/cc1200_spi_ripper
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_H7 V1.9.1
Application Structure	Advanced
Generate Under Root	Yes
Do not generate the main()	No
Minimum Heap Size	0x200
Minimum Stack Size	0x400

### 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	No
Backup previously generated files when re-generating	No
Keep User Code when re-generating	Yes
Delete previously generated files when not re-generated	Yes
Set all free pins as analog (to optimize the power consumption)	No
Enable Full Assert	No

### 5.3. Advanced Settings - Generated Function Calls

Rank	Function Name	Peripheral Instance Name
1	MX_GPIO_Init	GPIO
2	SystemClock_Config	RCC
3	MX_SPI1_Init	SPI1

## 6. Power Consumption Calculator report

### 6.1. Microcontroller Selection

Series	STM32H7
Line	STM32H723/733
MCU	STM32H723ZGTx
Datasheet	DS13313_Rev1

### 6.2. Parameter Selection

Temperature	25
Vdd	3.0

### 6.3. Battery Selection

Battery	Alkaline(9V)
Capacity	625.0 mAh
Self Discharge	0.3 %/month
Nominal Voltage	9.0 V
Max Cont Current	200.0 mA
Max Pulse Current	0.0 mA
Cells in series	1
Cells in parallel	1



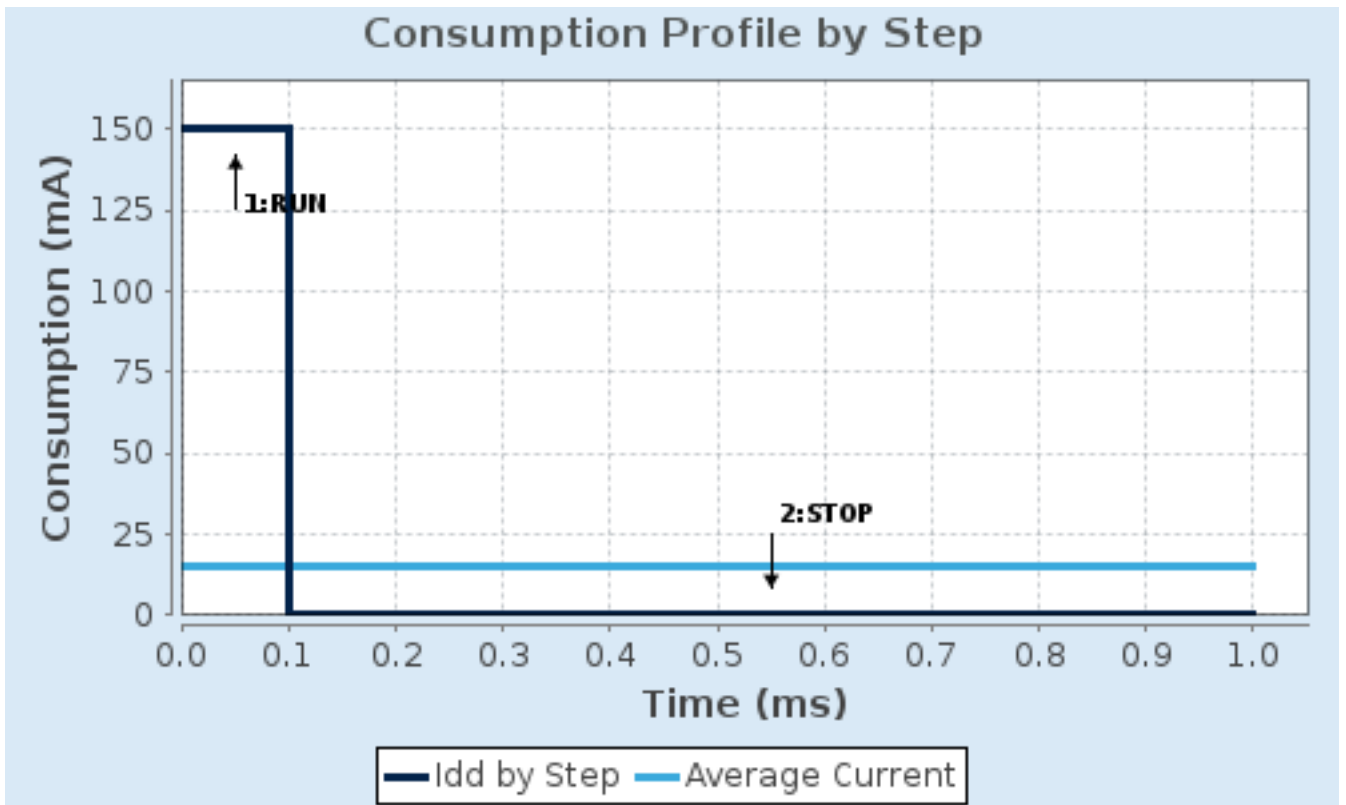
#### 6.4. Sequence

<b>Step</b>	Step1	Step2
<b>Mode</b>	RUN	STOP
<b>Vdd</b>	3.0	3.0
<b>Voltage Source</b>	Battery	Battery
<b>Range</b>	VOS0: Scale0/Boost	SVOS5: System-Scale5
<b>D1 Mode</b>	DRUN	DSTANDBY
<b>D2 Mode</b>	DRUN	DSTANDBY
<b>D3 Mode</b>	DRUN	DSTOP
<b>Fetch Type</b>	SRAM1/FlashMode- ON/Cache	NA
<b>CPU Frequency</b>	550 MHz	0 Hz
<b>Clock Configuration</b>	HSE BYP PLL	ALL CLOCKS OFF
<b>Clock Source Frequency</b>	8 MHz	0 Hz
<b>Peripherals</b>		
<b>Additional Cons.</b>	0 mA	0 mA
<b>Average Current</b>	150 mA	94.5 $\mu$ A
<b>Duration</b>	0.1 ms	0.9 ms
<b>DMIPS</b>	1177.0	0.0
<b>Ta Max</b>	105.2	124.99
<b>Category</b>	In DS Table	In DS Table

#### 6.5. Results

Sequence Time	1 ms	Average Current	15.09 mA
Battery Life	1 day, 17 hours	Average DMIPS	1177.0 DMIPS

#### 6.6. Chart



## 7. Peripherals and Middlewares Configuration

### 7.1. DEBUG

**Debug: Trace Asynchronous Sw**

### 7.2. RCC

**High Speed Clock (HSE): BYPASS Clock Source**

**Low Speed Clock (LSE) : Crystal/Ceramic Resonator**

#### 7.2.1. Parameter Settings:

##### **Power Parameters:**

SupplySource	PWR_LDO_SUPPLY
Power Regulator Voltage Scale	Power Regulator Voltage Scale 0

##### **RCC Parameters:**

TIM Prescaler Selection	Disabled
HSE Startup Timeout Value (ms)	100
LSE Startup Timeout Value (ms)	5000
CSI Calibration Value	16
HSI Calibration Value	32

##### **System Parameters:**

VDD voltage (V)	3.3
Flash Latency(WS)	3 WS (4 CPU cycle)

##### **PLL range Parameters:**

PLL1 input frequency range	Between 2 and 4 MHz
PLL1 clock Output range	Wide VCO range

### 7.3. SPI1

**Mode: Full-Duplex Master**

#### 7.3.1. Parameter Settings:

##### **Basic Parameters:**

Frame Format	Motorola
Data Size	4 Bits
First Bit	MSB First

##### **Clock Parameters:**

Prescaler (for Baud Rate)	2
Baud Rate	<b>85.0 MBits/s *</b>
Clock Polarity (CPOL)	Low

Clock Phase (CPHA)	1 Edge
<b>Advanced Parameters:</b>	
CRC Calculation	Disabled
NSSP Mode	Enabled
NSS Signal Type	Software
Fifo Threshold	Fifo Threshold 01 Data
Tx Crc Initialization Pattern	All Zero Pattern
Rx Crc Initialization Pattern	All Zero Pattern
Nss Polarity	Nss Polarity Low
Master Ss Idleness	00 Cycle
Master Inter Data Idleness	00 Cycle
Master Receiver Auto Susp	Disable
Master Keep Io State	Master Keep Io State Disable
IO Swap	Disabled

## 7.4. SYS

### Timebase Source: SysTick

\* User modified value

## 8. System Configuration

### 8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
DEBUG	PA13(JTMS/SWDIO)	DEBUG_JTMS-SWDIO	n/a	n/a	n/a	SWDIO
	PA14(JTCK/SWCLK)	DEBUG_JTCK-SWCLK	n/a	n/a	n/a	SWCLK
	PB3(JTDO/TRACESWO)	DEBUG_JTDO-SWO	n/a	n/a	n/a	SWO
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	
SPI1	PA5	SPI1_SCK	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA6	SPI1_MISO	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PD7	SPI1_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	Low	
Single Mapped Signals	PH1-OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	
	PC1	ETH_MDC	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA1	ETH_REF_CLK	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA2	ETH_MDIO	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA7	ETH_CRSDV	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PC4	ETH_RXD0	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PC5	ETH_RXD1	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PB13	ETH_TXD1	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PD8	USART3_TX	Alternate Function Push Pull	No pull-up and no pull-down	Low	STLK_VCP_RX
	PD9	USART3_RX	Alternate Function Push Pull	No pull-up and no pull-down	Low	STLK_VCP_TX
	PA9	USB_OTG_HS_VBUS	n/a	n/a	n/a	USB_FS_VBUS
	PA10	USB_OTG_HS_ID	Alternate Function Push Pull	No pull-up and no pull-down	Low	USB_FS_ID
	PG11	ETH_TX_EN	Alternate Function Push Pull	No pull-up and no pull-down	Low	
PG13	ETH_TXD0	Alternate Function Push Pull	No pull-up and no pull-down	Low		
GPIO	PC13	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	B1 (Blue_User_Button)
	PB0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_GREEN
	PB14	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_RED
	PD10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	USB_FS_PWR_EN
	PG7	GPIO_EXTI7	External Interrupt Mode with	No pull-up and no pull-down	n/a	USB_FS_OVCR

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
			Rising edge trigger detection			
	PE1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_YELLOW

### 8.2. DMA configuration

nothing configured in DMA service

### 8.3. BDMA configuration

nothing configured in DMA service

### 8.4. MDMA configuration

nothing configured in DMA service

## 8.5. NVIC configuration

### 8.5.1. NVIC

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
PVD/AVD through EXTI Line detection Interrupt		unused	
Flash global interrupt		unused	
RCC global interrupt		unused	
EXTI line[9:5] interrupts		unused	
SPI1 global interrupt		unused	
FPU global interrupt		unused	
HSEM1 global interrupt		unused	

### 8.5.2. NVIC Code generation

Enabled interrupt Table	Select for init sequence ordering	Generate IRQ handler	Call HAL handler
Non maskable interrupt	false	true	false
Hard fault interrupt	false	true	false
Memory management fault	false	true	false
Pre-fetch fault, memory access fault	false	true	false
Undefined instruction or illegal state	false	true	false
System service call via SWI instruction	false	true	false
Debug monitor	false	true	false
Pendable request for system service	false	true	false
System tick timer	false	true	true

\* User modified value

## 9. System Views

### 9.1. Category view

#### 9.1.1. Current



## 10. Docs & Resources

Type	Link
Datasheet	<a href="http://www.st.com/resource/en/datasheet/DM00701028.pdf">http://www.st.com/resource/en/datasheet/DM00701028.pdf</a>
Reference manual	<a href="http://www.st.com/resource/en/reference_manual/DM00603761.pdf">http://www.st.com/resource/en/reference_manual/DM00603761.pdf</a>
Programming manual	<a href="http://www.st.com/resource/en/programming_manual/DM00237416.pdf">http://www.st.com/resource/en/programming_manual/DM00237416.pdf</a>
Errata sheet	<a href="http://www.st.com/resource/en/errata_sheet/DM00625312.pdf">http://www.st.com/resource/en/errata_sheet/DM00625312.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/CD00167594.pdf">http://www.st.com/resource/en/application_note/CD00167594.pdf</a>
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