1. Description

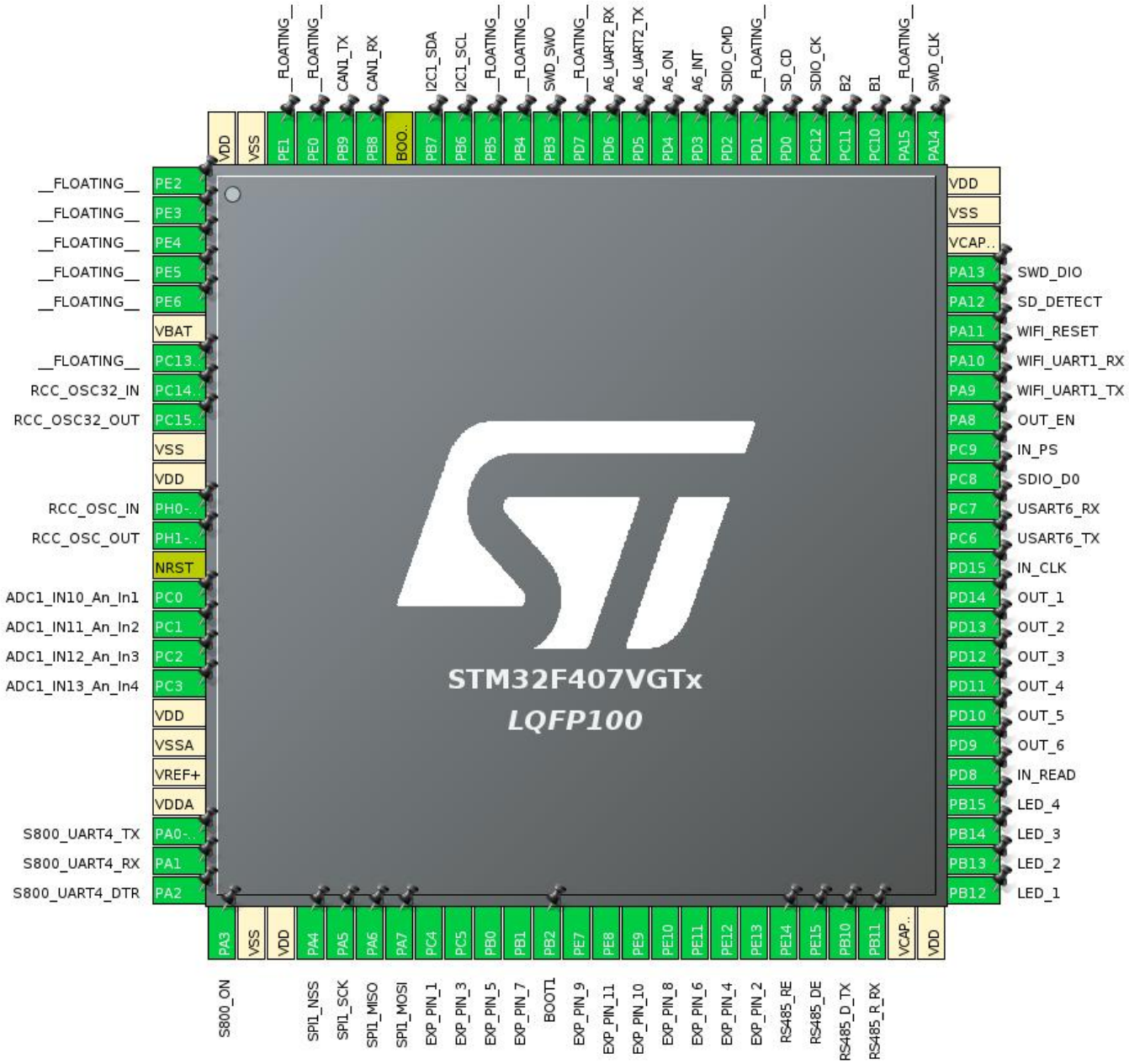
1.1. Project

Project Name	CubeMX
Board Name	custom
Generated with:	STM32CubeMX 5.2.1
Date	09/10/2019

1.2. MCU

MCU Series	STM32F4
MCU Line	STM32F407/417
MCU name	STM32F407VGTx
MCU Package	LQFP100
MCU Pin number	100

2. Pinout Configuration



3. Pins Configuration

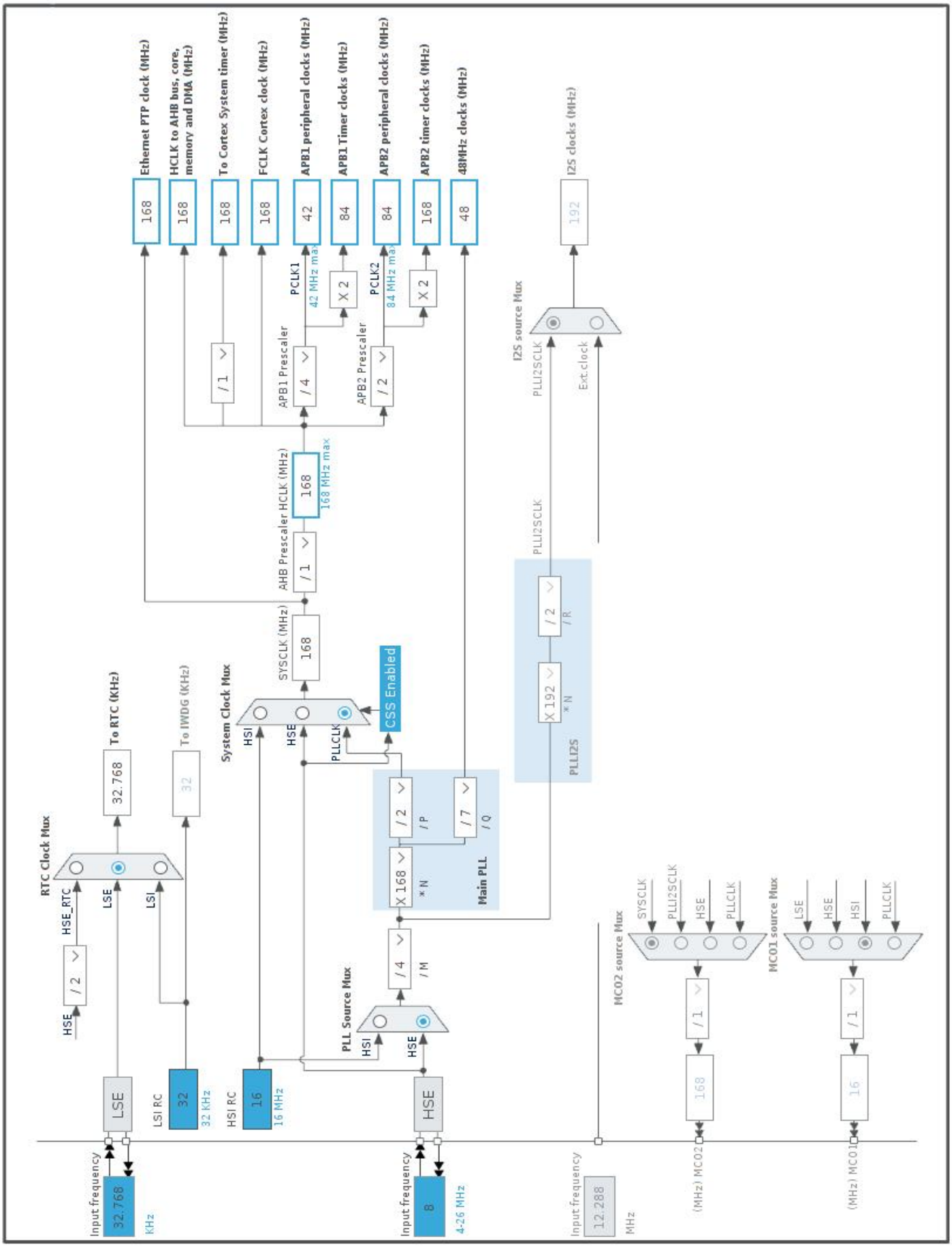
Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	PE2 *	I/O	GPIO_Analog	__FLOATING__
2	PE3 *	I/O	GPIO_Analog	__FLOATING__
3	PE4 *	I/O	GPIO_Analog	__FLOATING__
4	PE5 *	I/O	GPIO_Analog	__FLOATING__
5	PE6 *	I/O	GPIO_Analog	__FLOATING__
6	VBAT	Power		
7	PC13-ANTI_TAMP *	I/O	GPIO_Analog	__FLOATING__
8	PC14-OSC32_IN	I/O	RCC_OSC32_IN	
9	PC15-OSC32_OUT	I/O	RCC_OSC32_OUT	
10	VSS	Power		
11	VDD	Power		
12	PH0-OSC_IN	I/O	RCC_OSC_IN	
13	PH1-OSC_OUT	I/O	RCC_OSC_OUT	
14	NRST	Reset		
15	PC0	I/O	ADC1_IN10	ADC1_IN10_An_In1
16	PC1	I/O	ADC1_IN11	ADC1_IN11_An_In2
17	PC2	I/O	ADC1_IN12	ADC1_IN12_An_In3
18	PC3	I/O	ADC1_IN13	ADC1_IN13_An_In4
19	VDD	Power		
20	VSSA	Power		
21	VREF+	Power		
22	VDDA	Power		
23	PA0-WKUP	I/O	UART4_TX	S800_UART4_TX
24	PA1	I/O	UART4_RX	S800_UART4_RX
25	PA2 *	I/O	GPIO_Output	S800_UART4_DTR
26	PA3 *	I/O	GPIO_Output	S800_ON
27	VSS	Power		
28	VDD	Power		
29	PA4	I/O	SPI1_NSS	
30	PA5	I/O	SPI1_SCK	
31	PA6	I/O	SPI1_MISO	
32	PA7	I/O	SPI1_MOSI	
33	PC4 *	I/O	GPIO_Output	EXP_PIN_1
34	PC5 *	I/O	GPIO_Output	EXP_PIN_3
35	PB0 *	I/O	GPIO_Output	EXP_PIN_5
36	PB1 *	I/O	GPIO_Output	EXP_PIN_7

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
37	PB2 *	I/O	GPIO_Input	BOOT1
38	PE7 *	I/O	GPIO_Output	EXP_PIN_9
39	PE8 *	I/O	GPIO_Output	EXP_PIN_11
40	PE9 *	I/O	GPIO_Output	EXP_PIN_10
41	PE10 *	I/O	GPIO_Output	EXP_PIN_8
42	PE11 *	I/O	GPIO_Output	EXP_PIN_6
43	PE12 *	I/O	GPIO_Output	EXP_PIN_4
44	PE13 *	I/O	GPIO_Output	EXP_PIN_2
45	PE14 *	I/O	GPIO_Output	RS485_RE
46	PE15 *	I/O	GPIO_Output	RS485_DE
47	PB10	I/O	USART3_TX	RS485_D_TX
48	PB11	I/O	USART3_RX	RS485_R_RX
49	VCAP_1	Power		
50	VDD	Power		
51	PB12 *	I/O	GPIO_Output	LED_1
52	PB13 *	I/O	GPIO_Output	LED_2
53	PB14 *	I/O	GPIO_Output	LED_3
54	PB15 *	I/O	GPIO_Output	LED_4
55	PD8 *	I/O	GPIO_Input	IN_READ
56	PD9 *	I/O	GPIO_Output	OUT_6
57	PD10 *	I/O	GPIO_Output	OUT_5
58	PD11 *	I/O	GPIO_Output	OUT_4
59	PD12 *	I/O	GPIO_Output	OUT_3
60	PD13 *	I/O	GPIO_Output	OUT_2
61	PD14 *	I/O	GPIO_Output	OUT_1
62	PD15 *	I/O	GPIO_Output	IN_CLK
63	PC6	I/O	USART6_TX	
64	PC7	I/O	USART6_RX	
65	PC8	I/O	SDIO_D0	
66	PC9 *	I/O	GPIO_Output	IN_PS
67	PA8 *	I/O	GPIO_Output	OUT_EN
68	PA9	I/O	USART1_TX	WIFI_UART1_TX
69	PA10	I/O	USART1_RX	WIFI_UART1_RX
70	PA11 *	I/O	GPIO_Output	WIFI_RESET
71	PA12 *	I/O	GPIO_Input	SD_DETECT
72	PA13	I/O	SYS_JTMS-SWDIO	SWD_DIO
73	VCAP_2	Power		
74	VSS	Power		
75	VDD	Power		

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
76	PA14	I/O	SYS_JTCK-SWCLK	SWD_CLK
77	PA15 *	I/O	GPIO_Analog	__FLOATING__
78	PC10 *	I/O	GPIO_Input	B1
79	PC11 *	I/O	GPIO_Input	B2
80	PC12	I/O	SDIO_CK	
81	PD0 *	I/O	GPIO_Input	SD_CD
82	PD1 *	I/O	GPIO_Analog	__FLOATING__
83	PD2	I/O	SDIO_CMD	
84	PD3 *	I/O	GPIO_Output	A6_INT
85	PD4 *	I/O	GPIO_Output	A6_ON
86	PD5	I/O	USART2_TX	A6_UART2_TX
87	PD6	I/O	USART2_RX	A6_UART2_RX
88	PD7 *	I/O	GPIO_Analog	__FLOATING__
89	PB3	I/O	SYS_JTDO-SWO	SWD_SWO
90	PB4 *	I/O	GPIO_Analog	__FLOATING__
91	PB5 *	I/O	GPIO_Analog	__FLOATING__
92	PB6	I/O	I2C1_SCL	
93	PB7	I/O	I2C1_SDA	
94	BOOT0	Boot		
95	PB8	I/O	CAN1_RX	
96	PB9	I/O	CAN1_TX	
97	PE0 *	I/O	GPIO_Analog	__FLOATING__
98	PE1 *	I/O	GPIO_Analog	__FLOATING__
99	VSS	Power		
100	VDD	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	CubeMX
Project Folder	/home/royconejo/Projects/modulo_adquisidor/CubeMX
Toolchain / IDE	Makefile
Firmware Package Name and Version	STM32Cube FW_F4 V1.24.1

5.2. Code Generation Settings

Name	Value
STM32Cube Firmware Library Package	Add necessary library files as reference in the toolchain project configuration file
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

6. Power Consumption Calculator report

6.1. Microcontroller Selection

Series	STM32F4
Line	STM32F407/417
MCU	STM32F407VGTx
Datasheet	022152_Rev8

6.2. Parameter Selection

Temperature	25
Vdd	3.3

7. IPs and Middleware Configuration

7.1. ADC1

mode: IN10

mode: IN11

mode: IN12

mode: IN13

7.1.1. Parameter Settings:

ADCs_Common_Settings:

Mode	Independent mode

ADC_Settings:

Clock Prescaler	PCLK2 divided by 4
Resolution	12 bits (15 ADC Clock cycles)
Data Alignment	Right alignment
Scan Conversion Mode	Disabled
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	Disabled
End Of Conversion Selection	EOC flag at the end of single channel conversion

ADC_Regular_ConversionMode:

Number Of Conversion	1
External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None
Rank	1
Channel	Channel 10
Sampling Time	3 Cycles

ADC_Injected_ConversionMode:

Number Of Conversions	0

WatchDog:

Enable Analog WatchDog Mode	false

7.2. CAN1

mode: Mode

7.2.1. Parameter Settings:

Bit Timings Parameters:

Prescaler (for Time Quantum)	16

Time Quantum	**380.95238095238096 ***
Time Quanta in Bit Segment 1	1 Time
Time Quanta in Bit Segment 2	1 Time
ReSynchronization Jump Width	1 Time

Basic Parameters:

Time Triggered Communication Mode	Disable
Automatic Bus-Off Management	Disable
Automatic Wake-Up Mode	Disable
No-Automatic Retransmission	Disable
Receive Fifo Locked Mode	Disable
Transmit Fifo Priority	Disable

Advanced Parameters:

Operating Mode	Normal

7.3. I2C1

I2C: I2C

7.3.1. Parameter Settings:

Master Features:

I2C Speed Mode	Standard Mode
I2C Clock Speed (Hz)	100000

Slave Features:

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

7.4. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

Low Speed Clock (LSE) : Crystal/Ceramic Resonator

7.4.1. 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
HSE Startup Timout Value (ms)	100
LSE Startup Timout Value (ms)	5000

Power Parameters:

Power Regulatror Voltage Scale	Power Regulator Voltage Scale 1

7.5. RTC

mode: Activate Clock Source

7.5.1. Parameter Settings:

General:

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

7.6. SDIO

Mode: SD 1 bit

7.6.1. Parameter Settings:

SDIO parameters:

Clock transition on which the bit capture is made	Rising transition
SDIO Clock divider bypass	Disable
SDIO Clock output enable when the bus is idle	Disable the power save for the clock
SDIO hardware flow control	The hardware control flow is disabled
SDIOCLK clock divide factor	0

7.7. SPI1

Mode: Full-Duplex Master

Hardware NSS Signal: Hardware NSS Output Signal

7.7.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	8 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	2
Baud Rate	**42.0 MBits/s ***
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSS Signal Type	Output Hardware

7.8. SYS

Debug: Trace Asynchronous Sw

Timebase Source: SysTick

7.9. UART4

Mode: Asynchronous

7.9.1. 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

7.10. USART1

Mode: Asynchronous

7.10.1. 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

7.11. USART2

Mode: Asynchronous

7.11.1. 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

7.12. USART3

Mode: Asynchronous

7.12.1. 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

7.13. USART6

Mode: Asynchronous

7.13.1. 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

*** User modified value**

8. System Configuration

8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
ADC1	PC0	ADC1_IN10	Analog mode	No pull-up and no pull-down	n/a	ADC1_IN10_An_In1
	PC1	ADC1_IN11	Analog mode	No pull-up and no pull-down	n/a	ADC1_IN11_An_In2
	PC2	ADC1_IN12	Analog mode	No pull-up and no pull-down	n/a	ADC1_IN12_An_In3
	PC3	ADC1_IN13	Analog mode	No pull-up and no pull-down	n/a	ADC1_IN13_An_In4
CAN1	PB8	CAN1_RX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PB9	CAN1_TX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
I2C1	PB6	I2C1_SCL	Alternate Function Open Drain	**No pull-up and no pull-down ***	**Very High ***	
	PB7	I2C1_SDA	Alternate Function Open Drain	**No pull-up and no pull-down ***	**Very High ***	
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	
SDIO	PC8	SDIO_D0	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PC12	SDIO_CK	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PD2	SDIO_CMD	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
SPI1	PA4	SPI1_NSS	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PA5	SPI1_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PA6	SPI1_MISO	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PA7	SPI1_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	SWD_DIO
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	SWD_CLK

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PB3	SYS_JTDO-SWO	n/a	n/a	n/a	SWD_SWO
UART4	PA0-WKUP	UART4_TX	Alternate Function Push Pull	Pull-up	**Very High ***	S800_UART4_TX
	PA1	UART4_RX	Alternate Function Push Pull	Pull-up	**Very High ***	S800_UART4_RX
USART1	PA9	USART1_TX	Alternate Function Push Pull	Pull-up	**Very High ***	WIFI_UART1_TX
	PA10	USART1_RX	Alternate Function Push Pull	Pull-up	**Very High ***	WIFI_UART1_RX
USART2	PD5	USART2_TX	Alternate Function Push Pull	Pull-up	**Very High ***	A6_UART2_TX
	PD6	USART2_RX	Alternate Function Push Pull	Pull-up	**Very High ***	A6_UART2_RX
USART3	PB10	USART3_TX	Alternate Function Push Pull	Pull-up	**Very High ***	RS485_D_TX
	PB11	USART3_RX	Alternate Function Push Pull	Pull-up	**Very High ***	RS485_R_RX
USART6	PC6	USART6_TX	Alternate Function Push Pull	Pull-up	**Very High ***	
	PC7	USART6_RX	Alternate Function Push Pull	Pull-up	**Very High ***	
GPIO	PE2	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	__FLOATING__
	PE3	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	__FLOATING__
	PE4	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	__FLOATING__
	PE5	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	__FLOATING__
	PE6	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	__FLOATING__
	PC13-ANTI_TAMP	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	__FLOATING__
	PA2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	S800_UART4_DTR
	PA3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	S800_ON
	PC4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	EXP_PIN_1
	PC5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	EXP_PIN_3
	PB0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	EXP_PIN_5
	PB1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	EXP_PIN_7
	PB2	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	BOOT1
	PE7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	EXP_PIN_9
	PE8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	EXP_PIN_11
	PE9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	EXP_PIN_10

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PE10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	EXP_PIN_8
	PE11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	EXP_PIN_6
	PE12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	EXP_PIN_4
	PE13	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	EXP_PIN_2
	PE14	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	RS485_RE
	PE15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	RS485_DE
	PB12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_1
	PB13	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_2
	PB14	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_3
	PB15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_4
	PD8	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	IN_READ
	PD9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT_6
	PD10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT_5
	PD11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT_4
	PD12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT_3
	PD13	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT_2
	PD14	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT_1
	PD15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	IN_CLK
	PC9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	IN_PS
	PA8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	OUT_EN
	PA11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	WIFI_RESET
	PA12	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	SD_DETECT
	PA15	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	__FLOATING__
	PC10	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	B1
	PC11	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	B2
	PD0	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	SD_CD
	PD1	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	__FLOATING__
	PD3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	A6_INT
	PD4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	A6_ON
	PD7	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	__FLOATING__
	PB4	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	__FLOATING__
	PB5	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	__FLOATING__
	PE0	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	__FLOATING__
	PE1	GPIO_Analog	Analog mode	No pull-up and no pull-down	n/a	__FLOATING__

8.2. DMA configuration

nothing configured in DMA service

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
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 interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
ADC1, ADC2 and ADC3 global interrupts	unused		
CAN1 TX interrupts	unused		
CAN1 RX0 interrupts	unused		
CAN1 RX1 interrupt	unused		
CAN1 SCE interrupt	unused		
I2C1 event interrupt	unused		
I2C1 error interrupt	unused		
SPI1 global interrupt	unused		
USART1 global interrupt	unused		
USART2 global interrupt	unused		
USART3 global interrupt	unused		
SDIO global interrupt	unused		
UART4 global interrupt	unused		
USART6 global interrupt	unused		
FPU global interrupt	unused		

*** User modified value**

9. Software Pack Report