

1. Description

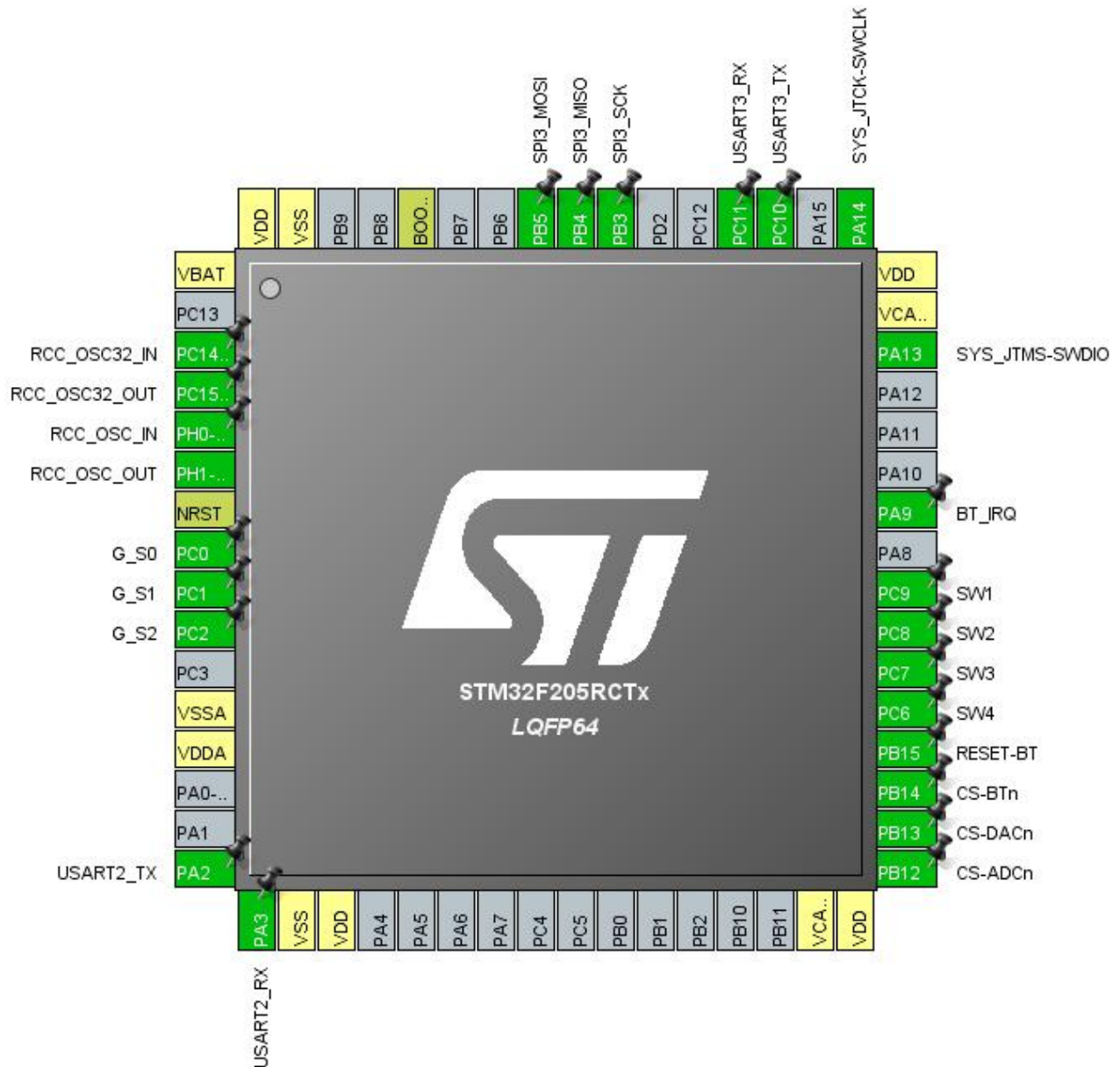
1.1. Project

Project Name	PSTATv1
Board Name	PSTATv1
Generated with:	STM32CubeMX 5.1.0
Date	04/07/2019

1.2. MCU

MCU Series	STM32F2
MCU Line	STM32F2x5
MCU name	STM32F205RCTx
MCU Package	LQFP64
MCU Pin number	64

2. Pinout Configuration



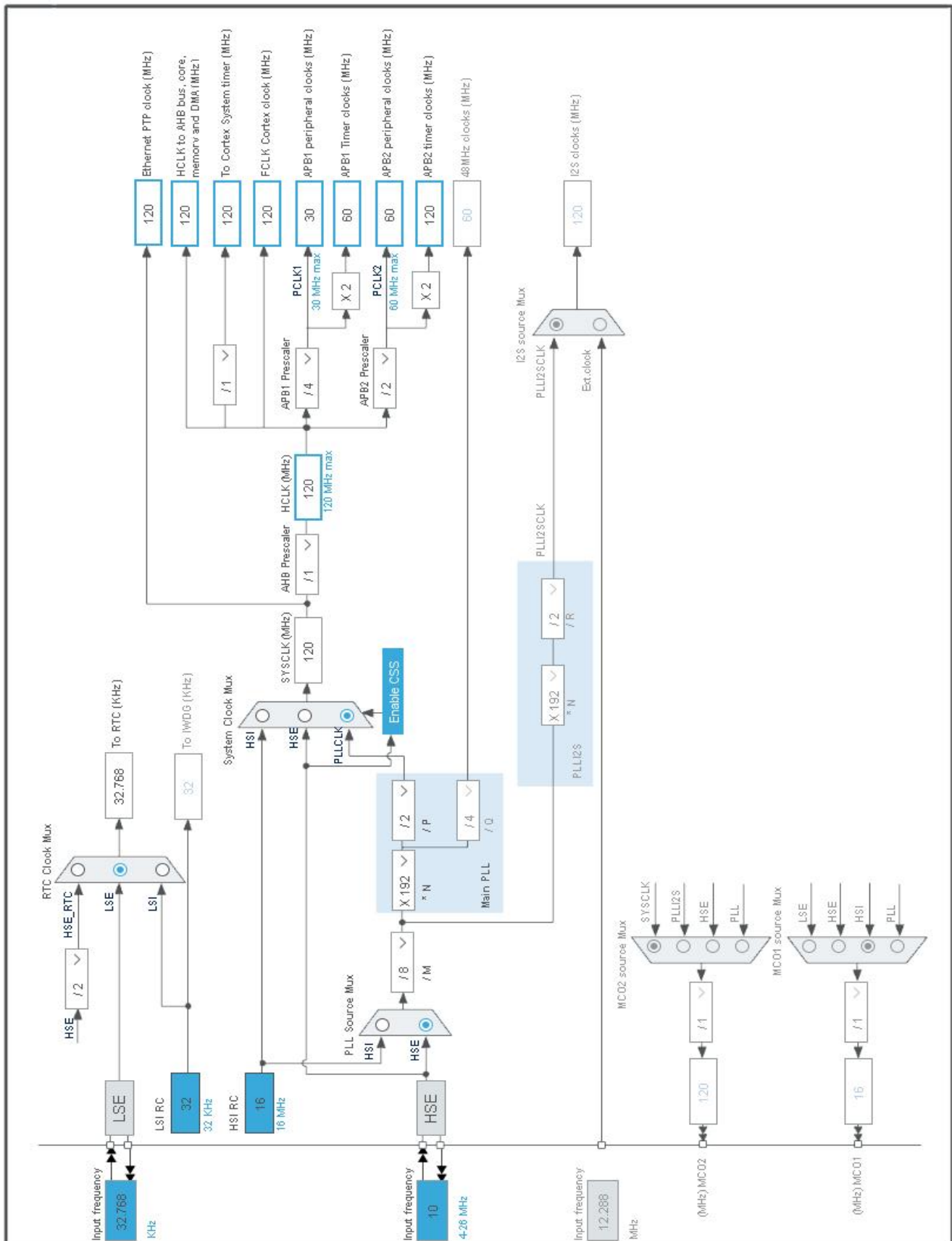
3. Pins Configuration

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
3	PC14-OSC32_IN	I/O	RCC_OSC32_IN	
4	PC15-OSC32_OUT	I/O	RCC_OSC32_OUT	
5	PH0-OSC_IN	I/O	RCC_OSC_IN	
6	PH1-OSC_OUT	I/O	RCC_OSC_OUT	
7	NRST	Reset		
8	PC0 *	I/O	GPIO_Output	G_S0
9	PC1 *	I/O	GPIO_Output	G_S1
10	PC2 *	I/O	GPIO_Output	G_S2
12	VSSA	Power		
13	VDDA	Power		
16	PA2	I/O	USART2_TX	
17	PA3	I/O	USART2_RX	
18	VSS	Power		
19	VDD	Power		
31	VCAP_1	Power		
32	VDD	Power		
33	PB12 *	I/O	GPIO_Output	CS-ADCn
34	PB13 *	I/O	GPIO_Output	CS-DACn
35	PB14 *	I/O	GPIO_Output	CS-BTn
36	PB15 *	I/O	GPIO_Output	RESET-BT
37	PC6 *	I/O	GPIO_Output	SW4
38	PC7 *	I/O	GPIO_Output	SW3
39	PC8 *	I/O	GPIO_Output	SW2
40	PC9 *	I/O	GPIO_Output	SW1
42	PA9	I/O	GPIO_EXTI9	BT_IRQ
46	PA13	I/O	SYS_JTMS-SWDIO	
47	VCAP_2	Power		
48	VDD	Power		
49	PA14	I/O	SYS_JTCK-SWCLK	
51	PC10	I/O	USART3_TX	
52	PC11	I/O	USART3_RX	
55	PB3	I/O	SPI3_SCK	
56	PB4	I/O	SPI3_MISO	
57	PB5	I/O	SPI3_MOSI	
60	BOOT0	Boot		

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
63	VSS	Power		
64	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	PSTATv1
Project Folder	C:\Users\Clyde W Phillips Jr\Desktop\BIG Smart-io Branch\BIG\Cube
Toolchain / IDE	SW4STM32
Firmware Package Name and Version	STM32Cube FW_F2 V1.7.0

5.2. 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

6. Power Consumption Calculator report

6.1. Microcontroller Selection

Series	STM32F2
Line	STM32F2x5
MCU	STM32F205RCTx
Datasheet	15818_Rev15

6.2. Parameter Selection

Temperature	25
Vdd	3.3

7. IPs and Middleware Configuration

7.1. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

Low Speed Clock (LSE) : Crystal/Ceramic Resonator

7.1.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Enabled
Data Cache	Enabled
Flash Latency(WS)	3 WS (4 CPU cycle)

RCC Parameters:

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

7.2. RTC

mode: Activate Clock Source

7.2.1. Parameter Settings:

General:

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

7.3. SPI3

Mode: Full-Duplex Master

7.3.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	8 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	32 *
Baud Rate	937.5 KBits/s *
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	2 Edge *
Advanced Parameters:	
CRC Calculation	Disabled
NSS Signal Type	Software

7.4. SYS

Debug: Serial Wire

Timebase Source: TIM1

7.5. TIM2

Clock Source : Internal Clock

7.5.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 32 bits value)	0xffffffff *
Internal Clock Division (CKD)	No Division
auto-reload preload	Disable

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit)	Disable (Trigger input effect not delayed)
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

7.6. TIM3

Clock Source : Internal Clock

7.6.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	0xffff *
Internal Clock Division (CKD)	No Division

auto-reload preload

Disable

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit)

Disable (Trigger input effect not delayed)

Trigger Event Selection

Enable (CNT_EN) *

7.7. USART2

Mode: Asynchronous

7.7.1. 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

7.8. USART3

Mode: Asynchronous

7.8.1. Parameter Settings:

Basic Parameters:

Baud Rate

9600 *

Word Length

8 Bits (including Parity)

Parity

None

Stop Bits

1

Advanced Parameters:

Data Direction

Receive and Transmit

Over Sampling

16 Samples

7.9. FATFS

mode: User-defined

7.9.1. Set Defines:

Version:

FATFS version R0.11

Function Parameters:

FS_READONLY (Read-only mode)	Disabled
FS_MINIMIZE (Minimization level)	Disabled
USE_STRFUNC (String functions)	Enabled with LF -> CRLF conversion
USE_FIND (Find functions)	Disabled
USE_MKFS (Make filesystem function)	Enabled
USE_FASTSEEK (Fast seek function)	Enabled
USE_LABEL (Volume label functions)	Disabled
USE_FORWARD (Forward function)	Disabled

Locale and Namespace Parameters:

CODE_PAGE (Code page on target)	Multilingual Latin 1 (OEM)
USE_LFN (Use Long Filename)	Disabled
MAX_LFN (Max Long Filename)	255
LFN_UNICODE (Enable Unicode)	ANSI/OEM
STRF_ENCODE (Character encoding)	UTF-8
FS_RPATH (Relative Path)	Disabled

Physical Drive Parameters:

VOLUMES (Logical drives)	1
MAX_SS (Maximum Sector Size)	512
MIN_SS (Minimum Sector Size)	512
MULTI_PARTITION (Volume partitions feature)	Disabled
USE_TRIM (Erase feature)	Disabled
FS_NOFSINFO (Force full FAT scan)	0

System Parameters:

FS_TINY (Tiny mode)	Disabled
FS_NORTC (Timestamp feature)	Dynamic timestamp
NORTC_YEAR (Year for timestamp)	2015
NORTC_MON (Month for timestamp)	6
NORTC_MDAY (Day for timestamp)	4
WORD_ACCESS (Platform dependent access option)	Byte access
FS_REENTRANT (Re-Entrancy)	Enabled
FS_TIMEOUT (Timeout ticks)	1000
SYNC_t (O/S sync object)	osSemaphoreId
FS_LOCK (Number of files opened simultaneously)	2

7.10. FREERTOS

Interface: CMSIS_V1

7.10.1. Config parameters:

API:

FreeRTOS API CMSIS v1

Versions:

FreeRTOS version 9.0.0

CMSIS-RTOS version 1.02

Kernel settings:

USE_PREEMPTION	Enabled
CPU_CLOCK_HZ	SystemCoreClock
TICK_RATE_HZ	1000
MAX_PRIORITIES	7
MINIMAL_STACK_SIZE	128
MAX_TASK_NAME_LEN	16
USE_16_BIT_TICKS	Disabled
IDLE_SHOULD_YIELD	Enabled
USE_MUTEXES	Enabled
USE_RECURSIVE_MUTEXES	Disabled
USE_COUNTING_SEMAPHORES	Disabled
QUEUE_REGISTRY_SIZE	8
USE_APPLICATION_TASK_TAG	Disabled
ENABLE_BACKWARD_COMPATIBILITY	Enabled
USE_PORT_OPTIMISED_TASK_SELECTION	Enabled
USE_TICKLESS_IDLE	Disabled
USE_TASK_NOTIFICATIONS	Enabled

Memory management settings:

Memory Allocation	Dynamic
TOTAL_HEAP_SIZE	15360
Memory Management scheme	heap_4

Hook function related definitions:

USE_IDLE_HOOK	Disabled
USE_TICK_HOOK	Disabled
USE_MALLOC_FAILED_HOOK	Disabled
USE_DAEMON_TASK_STARTUP_HOOK	Disabled
CHECK_FOR_STACK_OVERFLOW	Disabled

Run time and task stats gathering related definitions:

GENERATE_RUN_TIME_STATS	Disabled
USE_TRACE_FACILITY	Disabled
USE_STATS_FORMATTING_FUNCTIONS	Disabled

Co-routine related definitions:

USE_CO_ROUTINES	Disabled
MAX_CO_ROUTINE_PRIORITIES	2

Software timer definitions:

USE_TIMERS	Disabled
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Interrupt nesting behaviour configuration:

LIBRARY_LOWEST_INTERRUPT_PRIORITY	15
LIBRARY_MAX_SYSCALL_INTERRUPT_PRIORITY	5

7.10.2. Include parameters:

Include definitions:

vTaskPrioritySet	Enabled
uxTaskPriorityGet	Enabled
vTaskDelete	Enabled
vTaskCleanUpResources	Disabled
vTaskSuspend	Enabled
vTaskDelayUntil	Disabled
vTaskDelay	Enabled
xTaskGetSchedulerState	Enabled
xTaskResumeFromISR	Enabled
xQueueGetMutexHolder	Disabled
xSemaphoreGetMutexHolder	Disabled
pcTaskGetTaskName	Disabled
uxTaskGetStackHighWaterMark	Disabled
xTaskGetCurrentTaskHandle	Disabled
eTaskGetState	Disabled
xEventGroupSetBitFromISR	Disabled
xTimerPendFunctionCall	Disabled
xTaskAbortDelay	Disabled
xTaskGetHandle	Disabled

* User modified value

8. System Configuration

8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
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	
SPI3	PB3	SPI3_SCK	Alternate Function Push Pull	Pull-down *	Low	
	PB4	SPI3_MISO	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PB5	SPI3_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	Low	
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
USART2	PA2	USART2_TX	Alternate Function Push Pull	Pull-up	Low	
	PA3	USART2_RX	Alternate Function Push Pull	Pull-up	Low	
USART3	PC10	USART3_TX	Alternate Function Push Pull	Pull-up	High *	
	PC11	USART3_RX	Alternate Function Push Pull	Pull-up	High *	
GPIO	PC0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	G_S0
	PC1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	G_S1
	PC2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	G_S2
	PB12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	CS-ADCn
	PB13	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	CS-DACn
	PB14	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	CS-BTn
	PB15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	RESET-BT
	PC6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SW4
	PC7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SW3
	PC8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SW2
	PC9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	SW1
	PA9	GPIO_EXTI9	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	BT_IRQ

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	15	0
System tick timer	true	15	0
EXTI line[9:5] interrupts	true	5	0
TIM1 update interrupt and TIM10 global interrupt	true	0	0
TIM3 global interrupt	true	5	0
USART2 global interrupt	true	5	0
USART3 global interrupt	true	5	0
PVD interrupt through EXTI line16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
TIM2 global interrupt	unused		
SPI3 global interrupt	unused		

* User modified value

9. Software Pack Report