1. Description

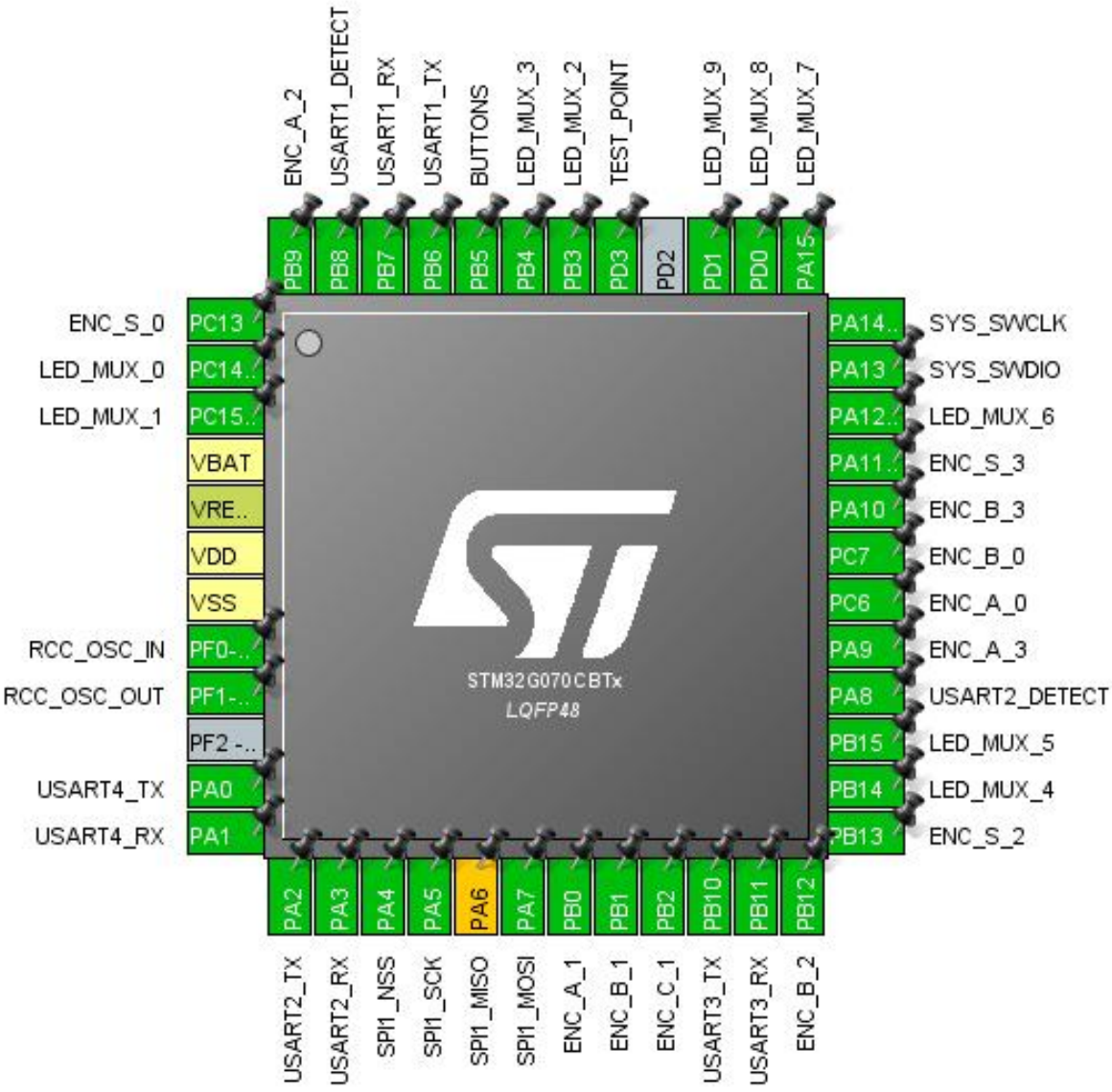
1.1. Project

Project Name	digiControl2
Board Name	custom
Generated with:	STM32CubeMX 5.0.0
Date	04/14/2019

1.2. MCU

MCU Series	STM32G0
MCU Line	STM32G0x0 Value line
MCU name	STM32G070CBTx
MCU Package	LQFP48
MCU Pin number	48

2. Pinout Configuration



3. Pins Configuration

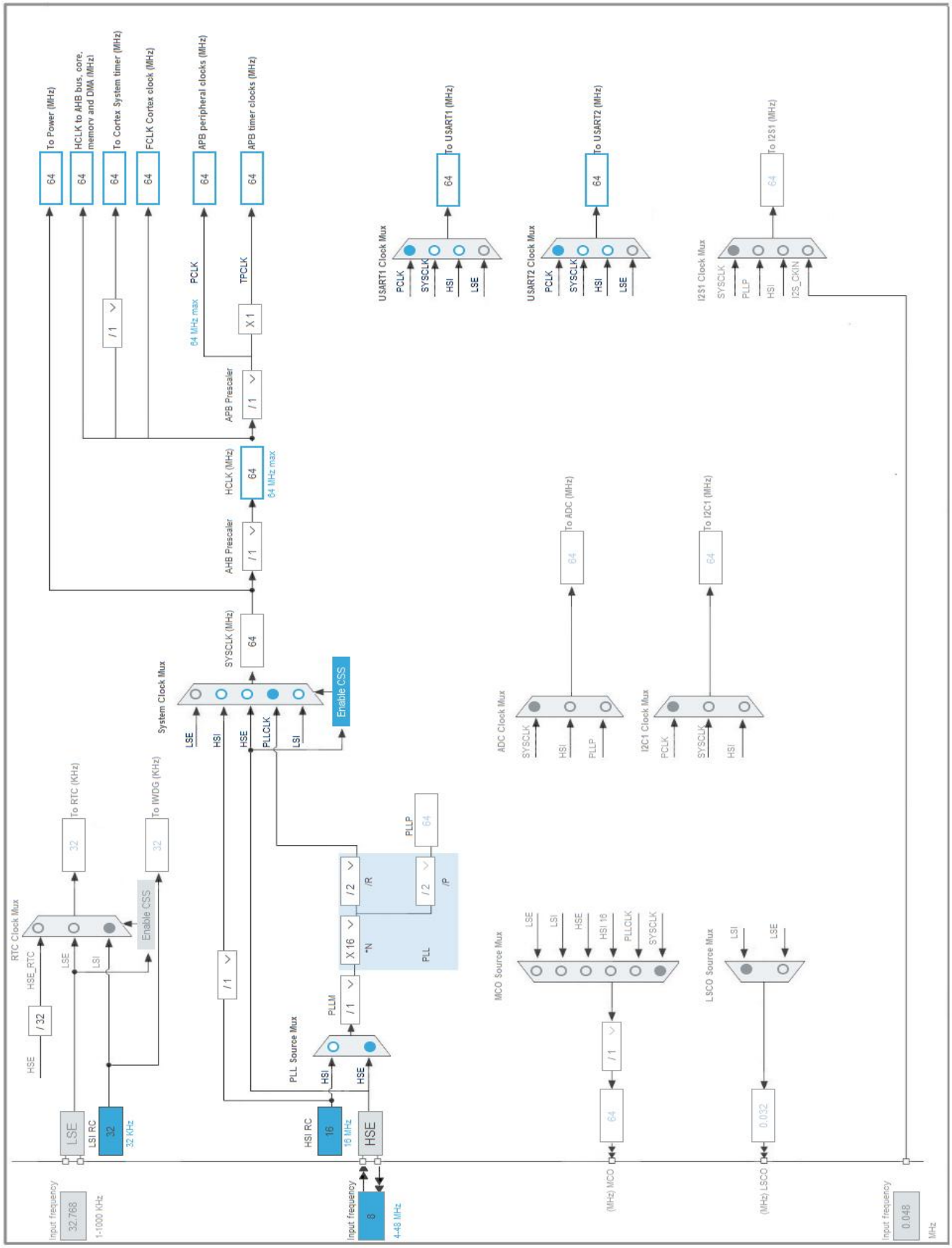
Pin Number LQFP48	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	PC13 *	I/O	GPIO_Input	ENC_S_0
2	PC14-OSC32_IN (PC14) *	I/O	GPIO_Output	LED_MUX_0
3	PC15-OSC32_OUT (PC15) *	I/O	GPIO_Output	LED_MUX_1
4	VBAT	Power		
5	VREF+	MonoIO		
6	VDD	Power		
7	VSS	Power		
8	PF0-OSC_IN (PF0)	I/O	RCC_OSC_IN	
9	PF1-OSC_OUT (PF1)	I/O	RCC_OSC_OUT	
11	PA0	I/O	USART4_TX	
12	PA1	I/O	USART4_RX	
13	PA2	I/O	USART2_TX	
14	PA3	I/O	USART2_RX	
15	PA4	I/O	SPI1_NSS	
16	PA5	I/O	SPI1_SCK	
17	PA6 **	I/O	SPI1_MISO	
18	PA7	I/O	SPI1_MOSI	
19	PB0 *	I/O	GPIO_Input	ENC_A_1
20	PB1 *	I/O	GPIO_Input	ENC_B_1
21	PB2 *	I/O	GPIO_Input	ENC_C_1
22	PB10	I/O	USART3_TX	
23	PB11	I/O	USART3_RX	
24	PB12 *	I/O	GPIO_Input	ENC_B_2
25	PB13 *	I/O	GPIO_Input	ENC_S_2
26	PB14 *	I/O	GPIO_Output	LED_MUX_4
27	PB15 *	I/O	GPIO_Output	LED_MUX_5
28	PA8 *	I/O	GPIO_Input	USART2_DETECT
29	PA9 *	I/O	GPIO_Input	ENC_A_3
30	PC6 *	I/O	GPIO_Input	ENC_A_0
31	PC7 *	I/O	GPIO_Input	ENC_B_0
32	PA10 *	I/O	GPIO_Input	ENC_B_3
33	PA11 [PA9] *	I/O	GPIO_Input	ENC_S_3
34	PA12 [PA10] *	I/O	GPIO_Output	LED_MUX_6
35	PA13	I/O	SYS_SWDIO	
36	PA14-BOOT0	I/O	SYS_SWCLK	

Pin Number LQFP48	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
37	PA15 *	I/O	GPIO_Output	LED_MUX_7
38	PD0 *	I/O	GPIO_Output	LED_MUX_8
39	PD1 *	I/O	GPIO_Output	LED_MUX_9
41	PD3 *	I/O	GPIO_Output	TEST_POINT
42	PB3 *	I/O	GPIO_Output	LED_MUX_2
43	PB4 *	I/O	GPIO_Output	LED_MUX_3
44	PB5 *	I/O	GPIO_Input	BUTTONS
45	PB6	I/O	USART1_TX	
46	PB7	I/O	USART1_RX	
47	PB8 *	I/O	GPIO_Input	USART1_DETECT
48	PB9 *	I/O	GPIO_Input	ENC_A_2

* The pin is affected with an I/O function

** The pin is affected with a peripheral function but no peripheral mode is activated

4. Clock Tree Configuration



5. Software Project

5.1. Project Settings

Name	Value
Project Name	digiControl2
Project Folder	C:\code\STM32_workspace_9.2\digiControl2\digiControl2
Toolchain / IDE	TrueSTUDIO
Firmware Package Name and Version	STM32Cube FW_G0 V1.0.0

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)	Yes

6. Power Consumption Calculator report

6.1. Microcontroller Selection

Series	STM32G0
Line	STM32G0x0 Value line
MCU	STM32G070CBTx
Datasheet	DS12766_Rev0

6.2. Parameter Selection

Temperature	25
Vdd	null

7. IPs and Middleware Configuration

7.1. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

7.1.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Disabled
Data Cache	Enabled
Flash Latency(WS)	2 WS (3 CPU cycle)

RCC Parameters:

HSI Calibration Value	64
HSE Startup Timout Value (ms)	100
LSE Startup Timout Value (ms)	5000

Power Parameters:

Power Regulator Voltage Scale	Power Regulator Voltage Scale 1

Peripherals Clock Configuration:

Generate the peripherals clock configuration	TRUE

7.2. SPI1

Mode: Transmit Only Master

Hardware NSS Signal: Hardware NSS Output Signal

7.2.1. Parameter Settings:

Basic Parameters:

Frame Format	**TI ***
Data Size	**16 Bits ***

Clock Parameters:

Prescaler (for Baud Rate)	**4 ***
Baud Rate	**16.0 MBits/s ***

Advanced Parameters:

CRC Calculation	Disabled
NSS Signal Type	Output Hardware

7.3. SYS

mode: Debug

Timebase Source: SysTick

7.4. USART1

Mode: Asynchronous

7.4.1. Parameter Settings:

Basic Parameters:

Baud Rate	115200
Word Length	**9 Bits (including Parity) ***
Parity	**Even ***
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples
Single Sample	Disable
ClockPrescaler	clock /1
Fifo Mode	Disable
Txfifo Threshold	1 eighth full configuration
Rxfifo Threshold	1 eighth full configuration

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

7.5. USART2

Mode: Asynchronous

7.5.1. Parameter Settings:

Basic Parameters:

Baud Rate	115200
Word Length	**9 Bits (including Parity) ***
Parity	**Even ***
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples
Single Sample	Disable
ClockPrescaler	clock /1
Fifo Mode	Disable
Txfifo Threshold	1 eighth full configuration
Rxfifo Threshold	1 eighth full configuration

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

7.6. USART3

Mode: Asynchronous

7.6.1. Parameter Settings:

Basic Parameters:

Baud Rate	115200
Word Length	**9 Bits (including Parity) ***
Parity	**Even ***
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples
Single Sample	Disable
ClockPrescaler	clock /1
Fifo Mode	Disable
Txfifo Threshold	1 eighth full configuration
Rxfifo Threshold	1 eighth full configuration

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

7.7. USART4

Mode: Asynchronous

7.7.1. Parameter Settings:

Basic Parameters:

Baud Rate	115200
Word Length	**9 Bits (including Parity) ***
Parity	**Even ***
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples
Single Sample	Disable
ClockPrescaler	clock /1
Fifo Mode	Disable
Txfifo Threshold	1 eighth full configuration
Rxfifo Threshold	1 eighth full configuration

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

*** 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	PF0-OSC_IN (PF0)	RCC_OSC_IN	n/a	n/a	n/a	
	PF1-OSC_OUT (PF1)	RCC_OSC_OUT	n/a	n/a	n/a	
SPI1	PA4	SPI1_NSS	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PA5	SPI1_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PA7	SPI1_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
SYS	PA13	SYS_SWDIO	n/a	n/a	n/a	
	PA14-BOOT0	SYS_SWCLK	n/a	n/a	n/a	
USART1	PB6	USART1_TX	Alternate Function Push Pull	Pull-up	Low	
	PB7	USART1_RX	Alternate Function Push Pull	Pull-up	Low	
USART2	PA2	USART2_TX	Alternate Function Push Pull	Pull-up	Low	
	PA3	USART2_RX	Alternate Function Push Pull	Pull-up	Low	
USART3	PB10	USART3_TX	Alternate Function Push Pull	Pull-up	Low	
	PB11	USART3_RX	Alternate Function Push Pull	Pull-up	Low	
USART4	PA0	USART4_TX	Alternate Function Push Pull	Pull-up	Low	
	PA1	USART4_RX	Alternate Function Push Pull	Pull-up	Low	
Single Mapped Signals	PA6	SPI1_MISO	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	ENC_S_0
	PC14-OSC32_IN (PC14)	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_MUX_0
	PC15-OSC32_OUT (PC15)	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_MUX_1
	PB0	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	ENC_A_1
	PB1	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	ENC_B_1
	PB2	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	ENC_C_1
	PB12	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	ENC_B_2
	PB13	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	ENC_S_2
	PB14	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_MUX_4
	PB15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_MUX_5
	PA8	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	USART2_DETECT

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PA9	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	ENC_A_3
	PC6	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	ENC_A_0
	PC7	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	ENC_B_0
	PA10	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	ENC_B_3
	PA11 [PA9]	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	ENC_S_3
	PA12 [PA10]	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_MUX_6
	PA15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_MUX_7
	PD0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_MUX_8
	PD1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_MUX_9
	PD3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	TEST_POINT
	PB3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_MUX_2
	PB4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED_MUX_3
	PB5	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	BUTTONS
	PB8	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	USART1_DETECT
	PB9	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	ENC_A_2

8.2. DMA configuration

DMA request	Stream	Direction	Priority
SPI1_TX	DMA1_Channel1	Memory To Peripheral	Low

SPI1_TX: DMA1_Channel1 DMA request Settings:

Mode:	Normal
Peripheral Increment:	Disable
Memory Increment:	Disable
Peripheral Data Width:	Half Word
Memory Data Width:	Half Word

8.3. 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
RCC global interrupt	true	0	0
DMA1 channel 1 interrupt	true	0	0
DMA1 channel 4, channel 5, channel 6, channel 7 and DMAMUX1 interrupts	true	0	0
SPI1 global interrupt	true	0	0
Flash global interrupt	unused		
USART1 global interrupt / USART1 wake-up interrupt through EXTI line 25	unused		
USART2 global interrupt / USART2 wake-up interrupt through EXTI line 26	unused		
USART3 and USART4 interrupts	unused		

*** User modified value**

9. Software Pack Report