



## 1. Description

### 1.1. Project

Project Name	myProject
Board Name	custom
Generated with:	STM32CubeMX 6.0.0
Date	08/02/2020

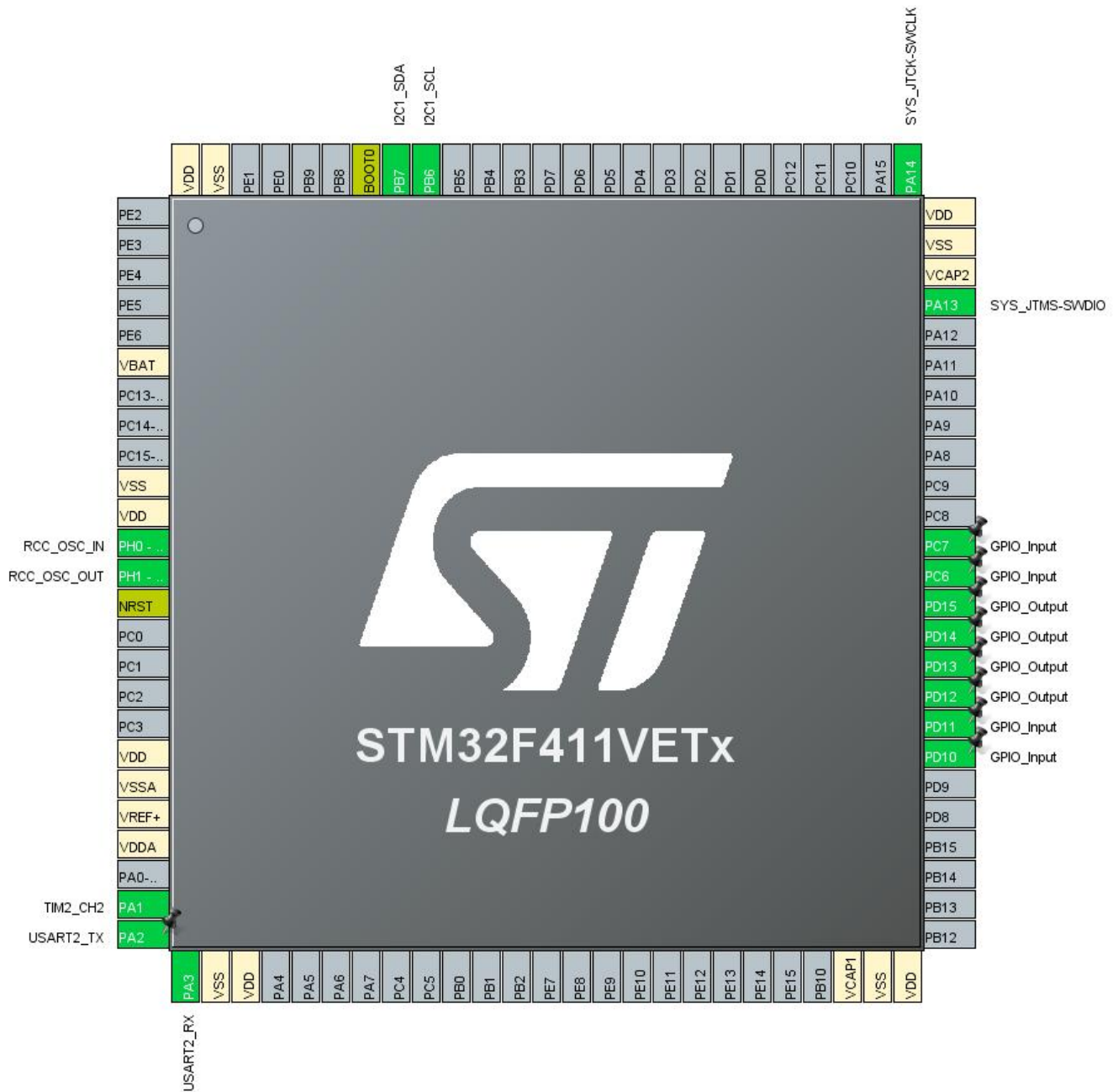
### 1.2. MCU

MCU Series	STM32F4
MCU Line	STM32F411
MCU name	STM32F411VETx
MCU Package	LQFP100
MCU Pin number	100

### 1.3. Core(s) information

Core(s)	Arm Cortex-M4
---------	---------------

## 2. Pinout Configuration

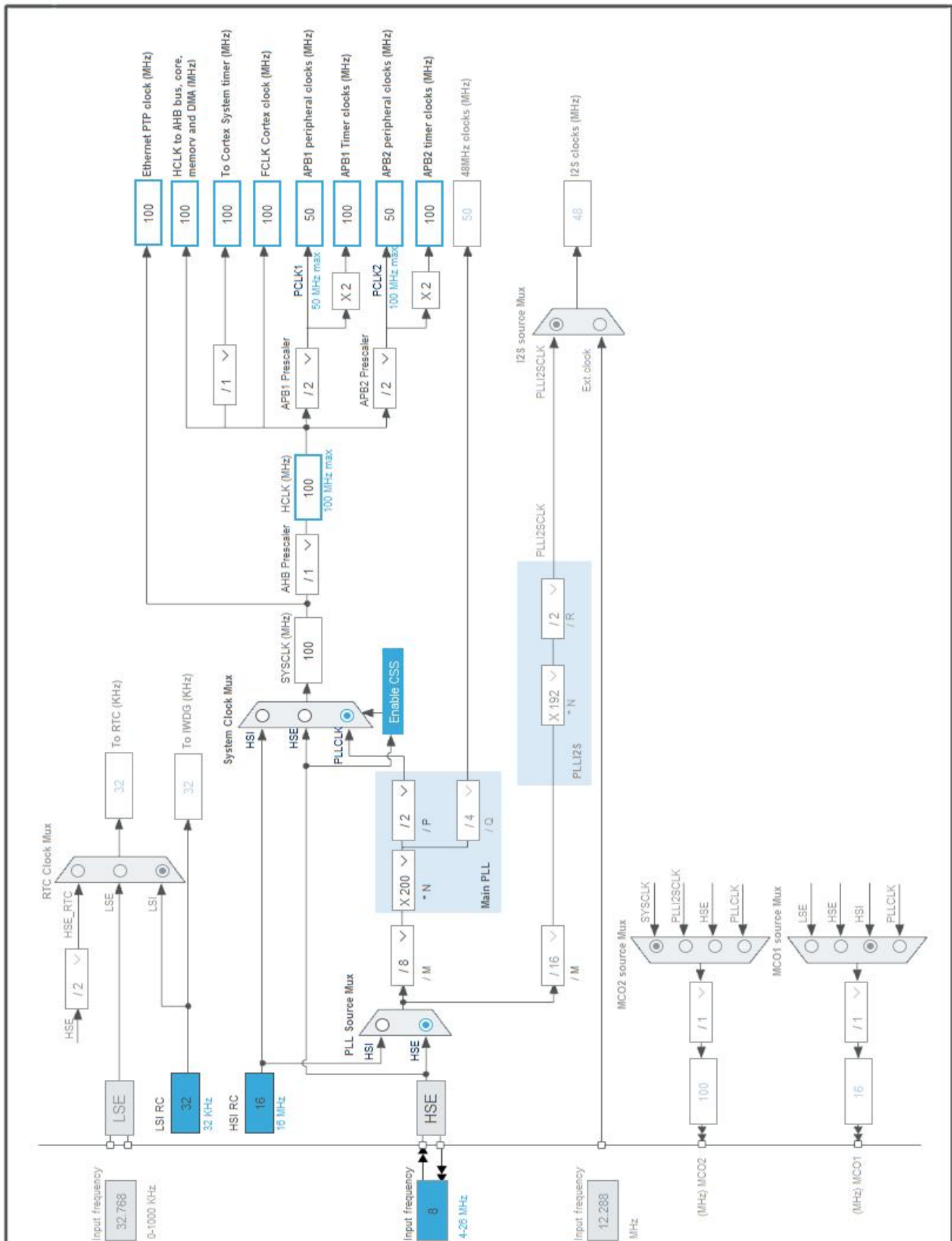


### 3. Pins Configuration

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
6	VBAT	Power		
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		
19	VDD	Power		
20	VSSA	Power		
21	VREF+	Power		
22	VDDA	Power		
24	PA1	I/O	TIM2_CH2	
25	PA2	I/O	USART2_TX	
26	PA3	I/O	USART2_RX	
27	VSS	Power		
28	VDD	Power		
48	VCAP1	Power		
49	VSS	Power		
50	VDD	Power		
57	PD10 *	I/O	GPIO_Input	
58	PD11 *	I/O	GPIO_Input	
59	PD12 *	I/O	GPIO_Output	
60	PD13 *	I/O	GPIO_Output	
61	PD14 *	I/O	GPIO_Output	
62	PD15 *	I/O	GPIO_Output	
63	PC6 *	I/O	GPIO_Input	
64	PC7 *	I/O	GPIO_Input	
72	PA13	I/O	SYS_JTMS-SWDIO	
73	VCAP2	Power		
74	VSS	Power		
75	VDD	Power		
76	PA14	I/O	SYS_JTCK-SWCLK	
92	PB6	I/O	I2C1_SCL	
93	PB7	I/O	I2C1_SDA	
94	BOOT0	Boot		
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	myProject
Project Folder	C:\Users\dotru\Desktop\OfficalPJ - C2
Toolchain / IDE	MDK-ARM V5.27
Firmware Package Name and Version	STM32Cube FW_F4 V1.25.0
Application Structure	Basic
Generate Under Root	No
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	Add necessary library files as reference in the toolchain project configuration file
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	IP Instance Name
1	MX_GPIO_Init	GPIO
2	MX_DMA_Init	DMA
3	SystemClock_Config	RCC
4	MX_USART2_UART_Init	USART2
5	MX_I2C1_Init	I2C1
6	MX_TIM2_Init	TIM2

## 6. Power Consumption Calculator report

### 6.1. Microcontroller Selection

Series	STM32F4
Line	STM32F411
MCU	STM32F411VETx
Datasheet	DS10314_Rev6

### 6.2. Parameter Selection

Temperature	25
Vdd	1.7

### 6.3. Battery Selection

Battery	Li-SOCL2(A3400)
Capacity	3400.0 mAh
Self Discharge	0.08 %/month
Nominal Voltage	3.6 V
Max Cont Current	100.0 mA
Max Pulse Current	200.0 mA
Cells in series	1
Cells in parallel	1



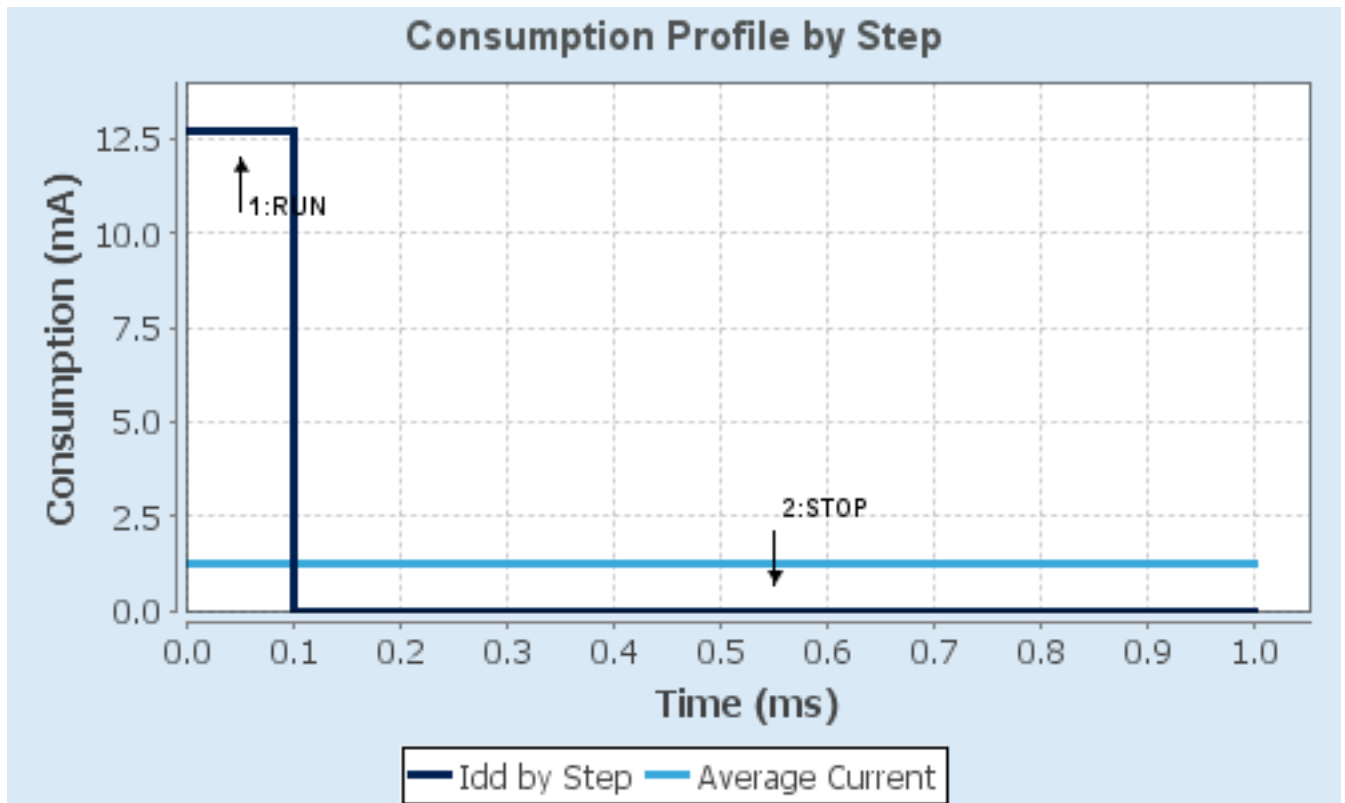
#### 6.4. Sequence

<b>Step</b>	Step1	Step2
<b>Mode</b>	RUN	STOP
<b>Vdd</b>	1.7	1.7
<b>Voltage Source</b>	Battery	Battery
<b>Range</b>	Scale1-High	No Scale
<b>Fetch Type</b>	SRAM	n/a
<b>CPU Frequency</b>	100 MHz	0 Hz
<b>Clock Configuration</b>	HSE PLL	Regulator_LPLV Flash-PwrDwn
<b>Clock Source Frequency</b>	4 MHz	0 Hz
<b>Peripherals</b>		
<b>Additional Cons.</b>	0 mA	0 mA
<b>Average Current</b>	12.7 mA	9 $\mu$ A
<b>Duration</b>	0.1 ms	0.9 ms
<b>DMIPS</b>	125.0	0.0
<b>Ta Max</b>	104.07	105
<b>Category</b>	In DS Table	In DS Table

#### 6.5. Results

Sequence Time	1 ms	Average Current	1.28 mA
Battery Life	3 months, 19 days, 6 hours	Average DMIPS	125.0 DMIPS

#### 6.6. Chart



## 7. IPs and Middleware Configuration

### 7.1. GPIO

### 7.2. I2C1

#### I2C: I2C

##### 7.2.1. 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

### 7.3. RCC

#### High Speed Clock (HSE): Crystal/Ceramic Resonator

##### 7.3.1. 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
TIM Prescaler Selection	Disabled
HSE Startup Timeout Value (ms)	100
LSE Startup Timeout Value (ms)	5000

###### Power Parameters:

Power Regulator Voltage Scale	Power Regulator Voltage Scale 1
-------------------------------	---------------------------------

## 7.4. SYS

**Debug: Serial Wire**

**Timebase Source: SysTick**

## 7.5. TIM2

**Clock Source : Internal Clock**

**Channel2: PWM Generation CH2**

### 7.5.1. Parameter Settings:

#### **Counter Settings:**

Prescaler (PSC - 16 bits value)	<b>100 *</b>
Counter Mode	Up
Counter Period (AutoReload Register - 32 bits value )	<b>100 *</b>
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)

#### **PWM Generation Channel 2:**

Mode	PWM mode 1
Pulse (32 bits value)	0
Output compare preload	Enable
Fast Mode	Disable
CH Polarity	High

## 7.6. USART2

**Mode: Asynchronous**

### 7.6.1. 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

\* User modified value

## 8. System Configuration

### 8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
I2C1	PB6	I2C1_SCL	Alternate Function Open Drain	Pull-up	<b>Very High</b> *	
	PB7	I2C1_SDA	Alternate Function Open Drain	Pull-up	<b>Very High</b> *	
RCC	PH0 - OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	
	PH1 - OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
TIM2	PA1	TIM2_CH2	Alternate Function Push Pull	No pull-up and no pull-down	Low	
USART2	PA2	USART2_TX	Alternate Function Push Pull	No pull-up and no pull-down	<b>Very High</b> *	
	PA3	USART2_RX	Alternate Function Push Pull	No pull-up and no pull-down	<b>Very High</b> *	
GPIO	PD10	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	
	PD11	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	
	PD12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PD13	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PD14	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PD15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PC6	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	
	PC7	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	

## 8.2. DMA configuration

DMA request	Stream	Direction	Priority
I2C1_RX	DMA1_Stream0	Peripheral To Memory	Low
USART2_RX	DMA1_Stream5	Peripheral To Memory	Low

### I2C1\_RX: DMA1\_Stream0 DMA request Settings:

Mode: Normal  
Use fifo: Disable  
Peripheral Increment: Disable  
Memory Increment: **Enable \***  
Peripheral Data Width: Byte  
Memory Data Width: Byte

### USART2\_RX: DMA1\_Stream5 DMA request Settings:

Mode: **Circular \***  
Use fifo: Disable  
Peripheral Increment: Disable  
Memory Increment: **Enable \***  
Peripheral Data Width: Byte  
Memory Data Width: Byte

### 8.3. NVIC configuration

#### 8.3.1. 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
DMA1 stream0 global interrupt	true	0	0
DMA1 stream5 global interrupt	true	0	0
I2C1 event interrupt	true	0	0
USART2 global interrupt	true	0	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
TIM2 global interrupt	unused		
I2C1 error interrupt	unused		
FPU global interrupt	unused		

#### 8.3.2. NVIC Code generation

Enabled interrupt Table	Select for init sequence ordering	Generate IRQ handler	Call HAL handler
Non maskable interrupt	true	true	false
Hard fault interrupt	true	true	false
Memory management fault	true	true	false
Pre-fetch fault, memory access fault	true	true	false
Undefined instruction or illegal state	true	true	false
System service call via SWI instruction	true	true	false
Debug monitor	true	true	false
Pendable request for system service	true	true	false
System tick timer	true	true	true
DMA1 stream0 global interrupt	true	true	true
DMA1 stream5 global interrupt	true	true	true
I2C1 event interrupt	true	true	true
USART2 global interrupt	true	true	true



**\* User modified value**

## 9. System Views

### 9.1. Category view

#### 9.1.1. Current

Middleware

System Core	Analog	Timers	Connectivity	Multimedia	Computing
DMA ✓		TIM2 ✓	I2C1 ✓		
GPIO ✓			USART2 ✓		
IIVIC ✓					
RCC ✓					
SYS ✓					

## 10. Docs & Resources

Type	Link
Datasheet	<a href="http://www.st.com/resource/en/datasheet/DM00115249.pdf">http://www.st.com/resource/en/datasheet/DM00115249.pdf</a>
Reference manual	<a href="http://www.st.com/resource/en/reference_manual/DM00119316.pdf">http://www.st.com/resource/en/reference_manual/DM00119316.pdf</a>
Programming manual	<a href="http://www.st.com/resource/en/programming_manual/DM00046982.pdf">http://www.st.com/resource/en/programming_manual/DM00046982.pdf</a>
Errata sheet	<a href="http://www.st.com/resource/en/errata_sheet/DM00137034.pdf">http://www.st.com/resource/en/errata_sheet/DM00137034.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>
Application note	<a href="http://www.st.com/resource/en/application_note/CD00211314.pdf">http://www.st.com/resource/en/application_note/CD00211314.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/CD00249778.pdf">http://www.st.com/resource/en/application_note/CD00249778.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/CD00259245.pdf">http://www.st.com/resource/en/application_note/CD00259245.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/CD00264321.pdf">http://www.st.com/resource/en/application_note/CD00264321.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/CD00264342.pdf">http://www.st.com/resource/en/application_note/CD00264342.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/CD00264379.pdf">http://www.st.com/resource/en/application_note/CD00264379.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00024853.pdf">http://www.st.com/resource/en/application_note/DM00024853.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00040802.pdf">http://www.st.com/resource/en/application_note/DM00040802.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00040808.pdf">http://www.st.com/resource/en/application_note/DM00040808.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00042534.pdf">http://www.st.com/resource/en/application_note/DM00042534.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00046011.pdf">http://www.st.com/resource/en/application_note/DM00046011.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00072315.pdf">http://www.st.com/resource/en/application_note/DM00072315.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00073742.pdf">http://www.st.com/resource/en/application_note/DM00073742.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00073853.pdf">http://www.st.com/resource/en/application_note/DM00073853.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00080497.pdf">http://www.st.com/resource/en/application_note/DM00080497.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00081379.pdf">http://www.st.com/resource/en/application_note/DM00081379.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00115714.pdf">http://www.st.com/resource/en/application_note/DM00115714.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00129215.pdf">http://www.st.com/resource/en/application_note/DM00129215.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00156364.pdf">http://www.st.com/resource/en/application_note/DM00156364.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00160482.pdf">http://www.st.com/resource/en/application_note/DM00160482.pdf</a>

Application note [http://www.st.com/resource/en/application\\_note/DM00144612.pdf](http://www.st.com/resource/en/application_note/DM00144612.pdf)

Application note [http://www.st.com/resource/en/application\\_note/DM00213525.pdf](http://www.st.com/resource/en/application_note/DM00213525.pdf)

Application note [http://www.st.com/resource/en/application\\_note/DM00220769.pdf](http://www.st.com/resource/en/application_note/DM00220769.pdf)

Application note [http://www.st.com/resource/en/application\\_note/DM00257177.pdf](http://www.st.com/resource/en/application_note/DM00257177.pdf)

Application note [http://www.st.com/resource/en/application\\_note/DM00272912.pdf](http://www.st.com/resource/en/application_note/DM00272912.pdf)

Application note [http://www.st.com/resource/en/application\\_note/DM00226326.pdf](http://www.st.com/resource/en/application_note/DM00226326.pdf)

Application note [http://www.st.com/resource/en/application\\_note/DM00236305.pdf](http://www.st.com/resource/en/application_note/DM00236305.pdf)

Application note [http://www.st.com/resource/en/application\\_note/DM00281138.pdf](http://www.st.com/resource/en/application_note/DM00281138.pdf)

Application note [http://www.st.com/resource/en/application\\_note/DM00296349.pdf](http://www.st.com/resource/en/application_note/DM00296349.pdf)

Application note [http://www.st.com/resource/en/application\\_note/DM00325582.pdf](http://www.st.com/resource/en/application_note/DM00325582.pdf)

Application note [http://www.st.com/resource/en/application\\_note/DM00327191.pdf](http://www.st.com/resource/en/application_note/DM00327191.pdf)

Application note [http://www.st.com/resource/en/application\\_note/DM00354244.pdf](http://www.st.com/resource/en/application_note/DM00354244.pdf)

Application note [http://www.st.com/resource/en/application\\_note/DM00315319.pdf](http://www.st.com/resource/en/application_note/DM00315319.pdf)

Application note [http://www.st.com/resource/en/application\\_note/DM00380469.pdf](http://www.st.com/resource/en/application_note/DM00380469.pdf)

Application note [http://www.st.com/resource/en/application\\_note/DM00395696.pdf](http://www.st.com/resource/en/application_note/DM00395696.pdf)

Application note [http://www.st.com/resource/en/application\\_note/DM00431633.pdf](http://www.st.com/resource/en/application_note/DM00431633.pdf)

Application note [http://www.st.com/resource/en/application\\_note/DM00493651.pdf](http://www.st.com/resource/en/application_note/DM00493651.pdf)

Application note [http://www.st.com/resource/en/application\\_note/DM00536349.pdf](http://www.st.com/resource/en/application_note/DM00536349.pdf)