

## 1. Description

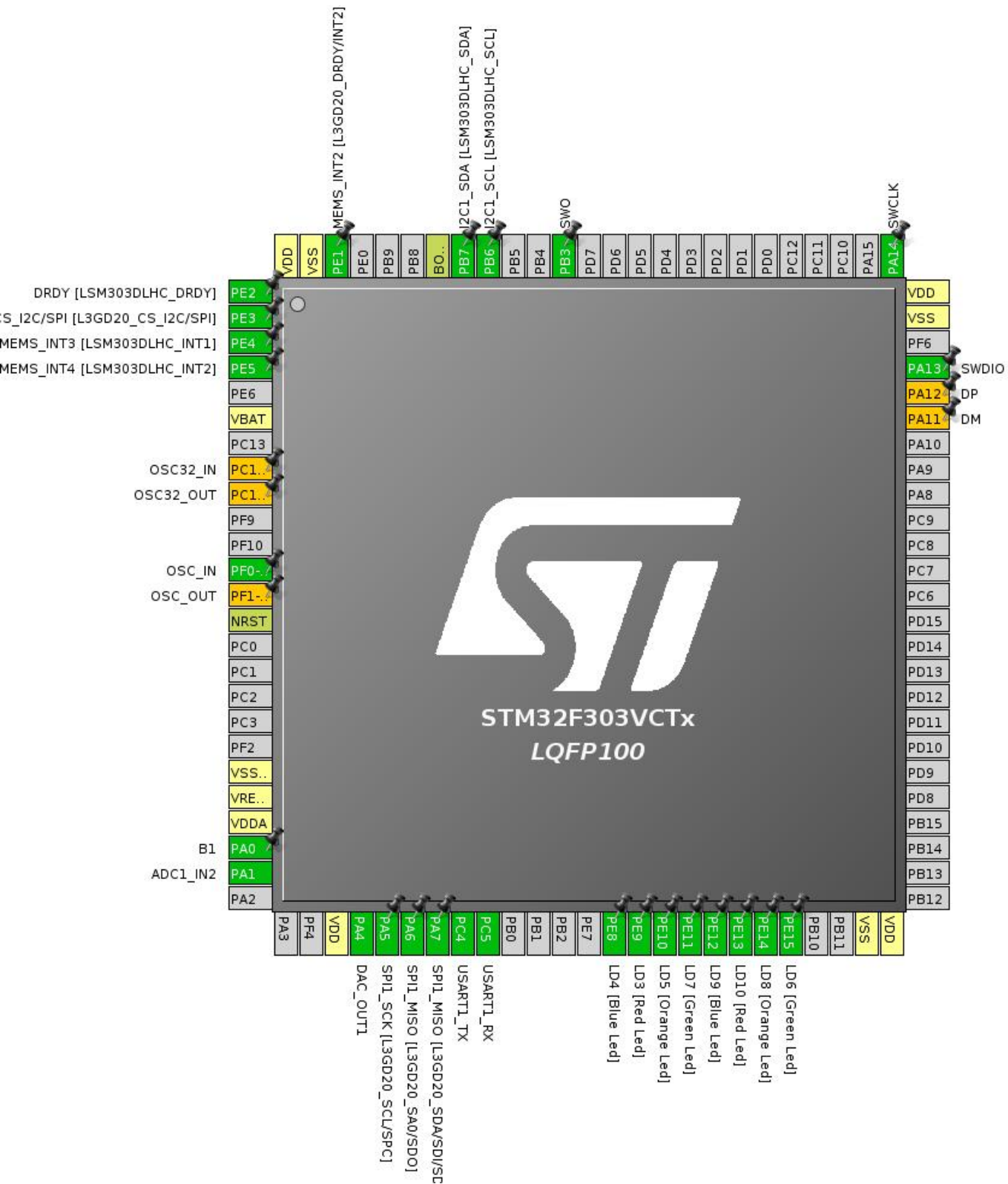
### 1.1. Project

Project Name	tst
Board Name	STM32F3DISCOVERY
Generated with:	STM32CubeMX 4.20.1
Date	04/08/2017

### 1.2. MCU

MCU Series	STM32F3
MCU Line	STM32F303
MCU name	STM32F303VCTx
MCU Package	LQFP100
MCU Pin number	100

## 2. Pinout Configuration



### 3. Pins Configuration

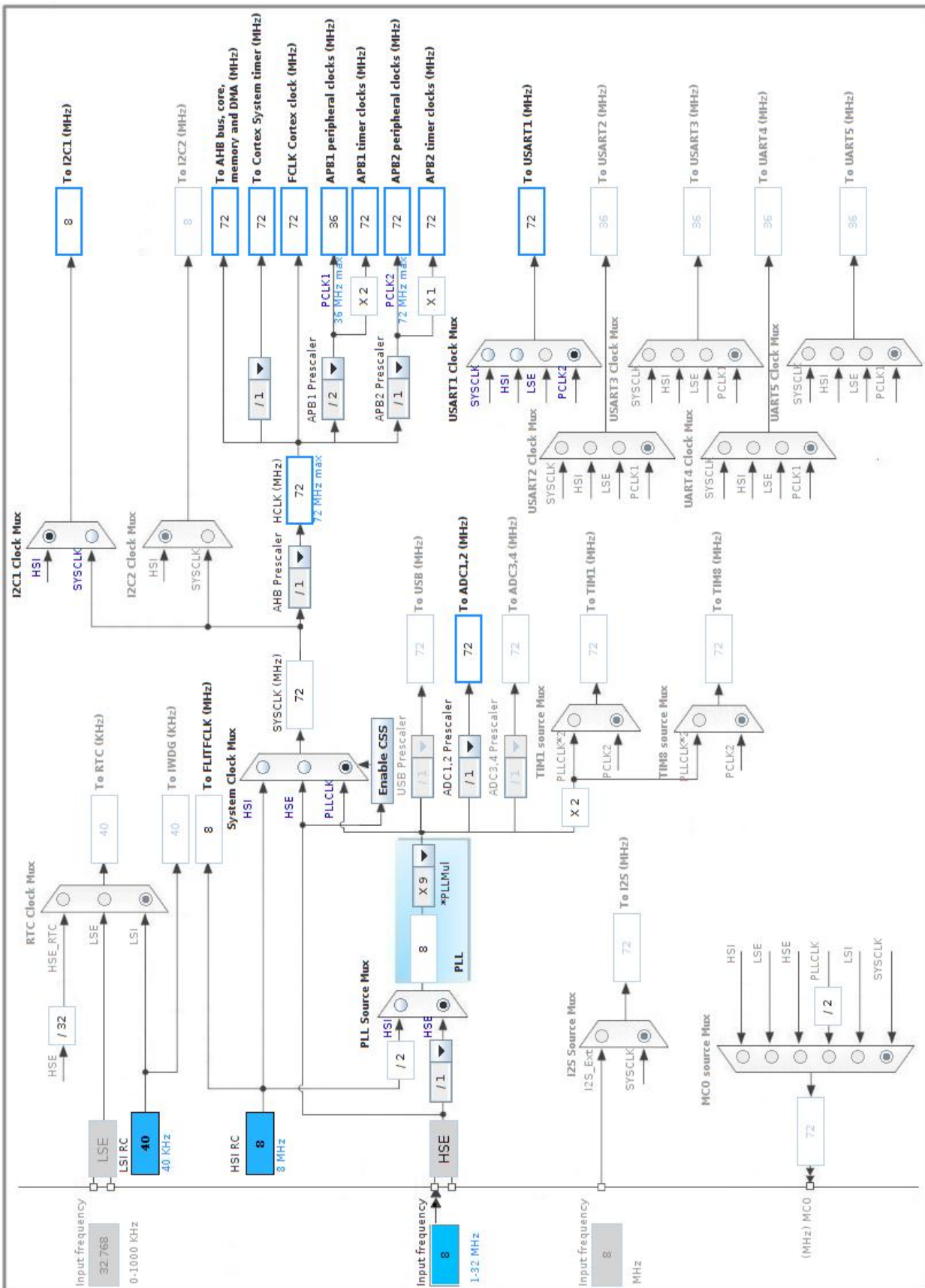
Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	PE2	I/O	GPIO_EXTI2	DRDY [LSM303DLHC_DRDY]
2	PE3 *	I/O	GPIO_Output	CS_I2C/SPI [L3GD20_CS_I2C/SPI]
3	PE4	I/O	GPIO_EXTI4	MEMS_INT3 [LSM303DLHC_INT1]
4	PE5	I/O	GPIO_EXTI5	MEMS_INT4 [LSM303DLHC_INT2]
6	VBAT	Power		
8	PC14-OSC32_IN **	I/O	RCC_OSC32_IN	OSC32_IN
9	PC15-OSC32_OUT **	I/O	RCC_OSC32_OUT	OSC32_OUT
12	PF0-OSC_IN	I/O	RCC_OSC_IN	OSC_IN
13	PF1-OSC_OUT **	I/O	RCC_OSC_OUT	OSC_OUT
14	NRST	Reset		
20	VSSA/VREF-	Power		
21	VREF+	Power		
22	VDDA	Power		
23	PA0	I/O	GPIO_EXTI0	B1
24	PA1	I/O	ADC1_IN2	
28	VDD	Power		
29	PA4	I/O	DAC_OUT1	
30	PA5	I/O	SPI1_SCK	SPI1_SCK [L3GD20_SCL/SPC]
31	PA6	I/O	SPI1_MISO	SPI1_MISO [L3GD20_SA0/SDO]
32	PA7	I/O	SPI1_MOSI	SPI1_MISO [L3GD20_SDA/SDI/SDO]
33	PC4	I/O	USART1_TX	
34	PC5	I/O	USART1_RX	
39	PE8 *	I/O	GPIO_Output	LD4 [Blue Led]
40	PE9 *	I/O	GPIO_Output	LD3 [Red Led]
41	PE10 *	I/O	GPIO_Output	LD5 [Orange Led]
42	PE11 *	I/O	GPIO_Output	LD7 [Green Led]
43	PE12 *	I/O	GPIO_Output	LD9 [Blue Led]
44	PE13 *	I/O	GPIO_Output	LD10 [Red Led]
45	PE14 *	I/O	GPIO_Output	LD8 [Orange Led]
46	PE15 *	I/O	GPIO_Output	LD6 [Green Led]

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
49	VSS	Power		
50	VDD	Power		
70	PA11 **	I/O	USB_DM	DM
71	PA12 **	I/O	USB_DP	DP
72	PA13	I/O	SYS_JTMS-SWDIO	SWDIO
74	VSS	Power		
75	VDD	Power		
76	PA14	I/O	SYS_JTCK-SWCLK	SWCLK
89	PB3	I/O	SYS_JTDO-TRACESWO	SWO
92	PB6	I/O	I2C1_SCL	I2C1_SCL [LSM303DLHC_SCL]
93	PB7	I/O	I2C1_SDA	I2C1_SDA [LSM303DLHC_SDA]
94	BOOT0	Boot		
98	PE1	I/O	GPIO_EXTI1	MEMS_INT2 [L3GD20_DRDY/INT2]
99	VSS	Power		
100	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

## 4. Clock Tree Configuration



## 5. IPs and Middleware Configuration

### 5.1. ADC1

#### IN2: IN2 Single-ended

##### 5.1.1. Parameter Settings:

###### ADCs\_Common\_Settings:

Mode Independent mode

###### ADC\_Settings:

Clock Prescaler ADC Asynchronous clock mode

Resolution **ADC 8-bit resolution \***

Data Alignment Right alignment

Scan Conversion Mode Disabled

Continuous Conversion Mode Disabled

Discontinuous Conversion Mode Disabled

DMA Continuous Requests Disabled

End Of Conversion Selection End of single conversion

Overrun behaviour Overrun data overwritten

Low Power Auto Wait Disabled

###### ADC\_Regular\_ConversionMode:

Enable Regular Conversions Enable

Number Of Conversion 1

External Trigger Conversion Source Regular Conversion launched by software

External Trigger Conversion Edge None

Rank 1

Channel Channel 2

Sampling Time 1.5 Cycles

Offset Number No offset

Offset 0

###### ADC\_Injected\_ConversionMode:

Enable Injected Conversions Enable

Number Of Conversions 0

###### Analog Watchdog 1:

Enable Analog WatchDog1 Mode false

###### Analog Watchdog 2:

Enable Analog WatchDog2 Mode false

###### Analog Watchdog 3:

Enable Analog WatchDog3 Mode false

## 5.2. DAC

### mode: OUT1 Configuration

#### 5.2.1. Parameter Settings:

##### DAC Out1 Settings:

Output Buffer	Enable
Trigger	Timer 6 Trigger Out event *
Wave generation mode	Disabled

## 5.3. I2C1

### I2C: I2C

#### 5.3.1. Parameter Settings:

##### Timing configuration:

I2C Speed Mode	Fast Mode *
I2C Speed Frequency (KHz)	400
Rise Time (ns)	0
Fall Time (ns)	0
Coefficient of Digital Filter	0
Analog Filter	Enabled
Timing	0x0000020B *

##### Slave Features:

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

## 5.4. RCC

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

### 5.4.1. Parameter Settings:

#### System Parameters:

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

#### RCC Parameters:

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

## 5.5. SPI1

### Mode: Full-Duplex Master

### 5.5.1. Parameter Settings:

#### Basic Parameters:

Frame Format	Motorola
Data Size	4 Bits
First Bit	MSB First

#### Clock Parameters:

Prescaler (for Baud Rate)	64 *
Baud Rate	1.125 MBits/s *
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

#### Advanced Parameters:

CRC Calculation	Disabled
NSSP Mode	Enabled
NSS Signal Type	Software

## 5.6. SYS

### Debug: Trace Asynchronous Sw

### Timebase Source: SysTick



## 5.7. TIM6

mode: Activated

### 5.7.1. Parameter Settings:

#### Counter Settings:

Prescaler (PSC - 16 bits value)	71 *
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value )	10000 *
auto-reload preload	Enable *

#### Trigger Output (TRGO) Parameters:

Trigger Event Selection	Update Event *
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## 5.8. TIM7

mode: Activated

### 5.8.1. Parameter Settings:

#### Counter Settings:

Prescaler (PSC - 16 bits value)	71 *
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value )	1000 *
auto-reload preload	Enable *

#### Trigger Output (TRGO) Parameters:

Trigger Event Selection	Update Event *
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## 5.9. USART1

Mode: Asynchronous

### 5.9.1. Parameter Settings:

#### Basic Parameters:

Baud Rate	115200 *
Word Length	8 Bits (including Parity)

Parity	None
Stop Bits	1
<b>Advanced Parameters:</b>	
Data Direction	Receive and Transmit
Over Sampling	16 Samples
Single Sample	Disable
<b>Advanced Features:</b>	
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

\* User modified value

## 6. System Configuration

### 6.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
ADC1	PA1	ADC1_IN2	Analog mode	No pull up pull down	n/a	
DAC	PA4	DAC_OUT1	Analog mode	No pull up pull down	n/a	
I2C1	PB6	I2C1_SCL	Alternate Function Open Drain	Pull up	Low	I2C1_SCL [LSM303DLHC_SCL]
	PB7	I2C1_SDA	Alternate Function Open Drain	Pull up	Low	I2C1_SDA [LSM303DLHC_SDA]
RCC	PF0-OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	OSC_IN
SPI1	PA5	SPI1_SCK	Alternate Function Push Pull	No pull up pull down	Low	SPI1_SCK [L3GD20_SCL/SPC]
	PA6	SPI1_MISO	Alternate Function Push Pull	No pull up pull down	Low	SPI1_MISO [L3GD20_SA0/SDO]
	PA7	SPI1_MOSI	Alternate Function Push Pull	No pull up pull down	Low	SPI1_MISO [L3GD20_SDA/SDI/SDO]
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	SWDIO
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	SWCLK
	PB3	SYS_JTDO-TRACESWO	n/a	n/a	n/a	SWO
USART1	PC4	USART1_TX	Alternate Function Push Pull	Pull up	High *	
	PC5	USART1_RX	Alternate Function Push Pull	Pull up	High *	
Single Mapped Signals	PC14-OSC32_IN	RCC_OSC32_IN	n/a	n/a	n/a	OSC32_IN
	PC15-OSC32_OUT	RCC_OSC32_OUT	n/a	n/a	n/a	OSC32_OUT
	PF1-OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	OSC_OUT
	PA11	USB_DM	Alternate Function Push Pull	No pull up pull down	High *	DM
	PA12	USB_DP	Alternate Function Push Pull	No pull up pull down	High *	DP
GPIO	PE2	GPIO_EXTI2	<b>External Event Mode with Rising edge trigger detection *</b>	No pull up pull down	n/a	DRDY [LSM303DLHC_DRDY]
	PE3	GPIO_Output	Output Push Pull	No pull up pull down	Low	CS_I2C/SPI [L3GD20_CS_I2C/SPI]
	PE4	GPIO_EXTI4		No pull up pull down	n/a	MEMS_INT3

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
			<b>External Event Mode with Rising edge trigger detection *</b>			[LSM303DLHC_INT1]
	PE5	GPIO_EXTI5	<b>External Event Mode with Rising edge trigger detection *</b>	No pull up pull down	n/a	MEMS_INT4 [LSM303DLHC_INT2]
	PA0	GPIO_EXTI0	External Interrupt Mode with Rising edge trigger detection	No pull up pull down	n/a	B1
	PE8	GPIO_Output	Output Push Pull	No pull up pull down	Low	LD4 [Blue Led]
	PE9	GPIO_Output	Output Push Pull	No pull up pull down	Low	LD3 [Red Led]
	PE10	GPIO_Output	Output Push Pull	No pull up pull down	Low	LD5 [Orange Led]
	PE11	GPIO_Output	Output Push Pull	No pull up pull down	Low	LD7 [Green Led]
	PE12	GPIO_Output	Output Push Pull	No pull up pull down	Low	LD9 [Blue Led]
	PE13	GPIO_Output	Output Push Pull	No pull up pull down	Low	LD10 [Red Led]
	PE14	GPIO_Output	Output Push Pull	No pull up pull down	Low	LD8 [Orange Led]
	PE15	GPIO_Output	Output Push Pull	No pull up pull down	Low	LD6 [Green Led]
	PE1	GPIO_EXTI1	<b>External Event Mode with Rising edge trigger detection *</b>	No pull up pull down	n/a	MEMS_INT2 [L3GD20_DRDY/INT2]

## 6.2. DMA configuration

DMA request	Stream	Direction	Priority
DAC_CH1	DMA1_Channel3	Memory To Peripheral	Low

### DAC\_CH1: DMA1\_Channel3 DMA request Settings:

Mode: **Circular \***  
Peripheral Increment: Disable  
Memory Increment: **Enable \***  
Peripheral Data Width: Half Word  
Memory Data Width: Half Word

### 6.3. 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
Flash global interrupt	true	0	0
EXTI line0 interrupt	true	0	2
DMA1 channel3 global interrupt	true	0	0
ADC1 and ADC2 interrupts	true	0	1
USART1 global interrupt / USART1 wake-up interrupt through EXTI line 25	true	0	0
Timer 6 interrupt and DAC underrun interrupts	true	0	0
TIM7 global interrupt	true	0	0
PVD interrupt through EXTI line16	unused		
RCC global interrupt	unused		
I2C1 event global interrupt / I2C1 wake-up interrupt through EXTI line 23	unused		
I2C1 error interrupt	unused		
SPI1 global interrupt	unused		
Floating point unit interrupt	unused		

\* User modified value

## ***7. Power Consumption Calculator report***

### 7.1. Microcontroller Selection

Series	STM32F3
Line	STM32F303
MCU	STM32F303VCTx
Datasheet	023353_Rev13

### 7.2. Parameter Selection

Temperature	25
Vdd	3.6

## 8. Software Project

### 8.1. Project Settings

Name	Value
Project Name	tst
Project Folder	/home/koala/workspace/embedded_project/ADC-DAC-tst
Toolchain / IDE	SW4STM32
Firmware Package Name and Version	STM32Cube FW_F3 V1.7.0

### 8.2. 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	No
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