1. Description

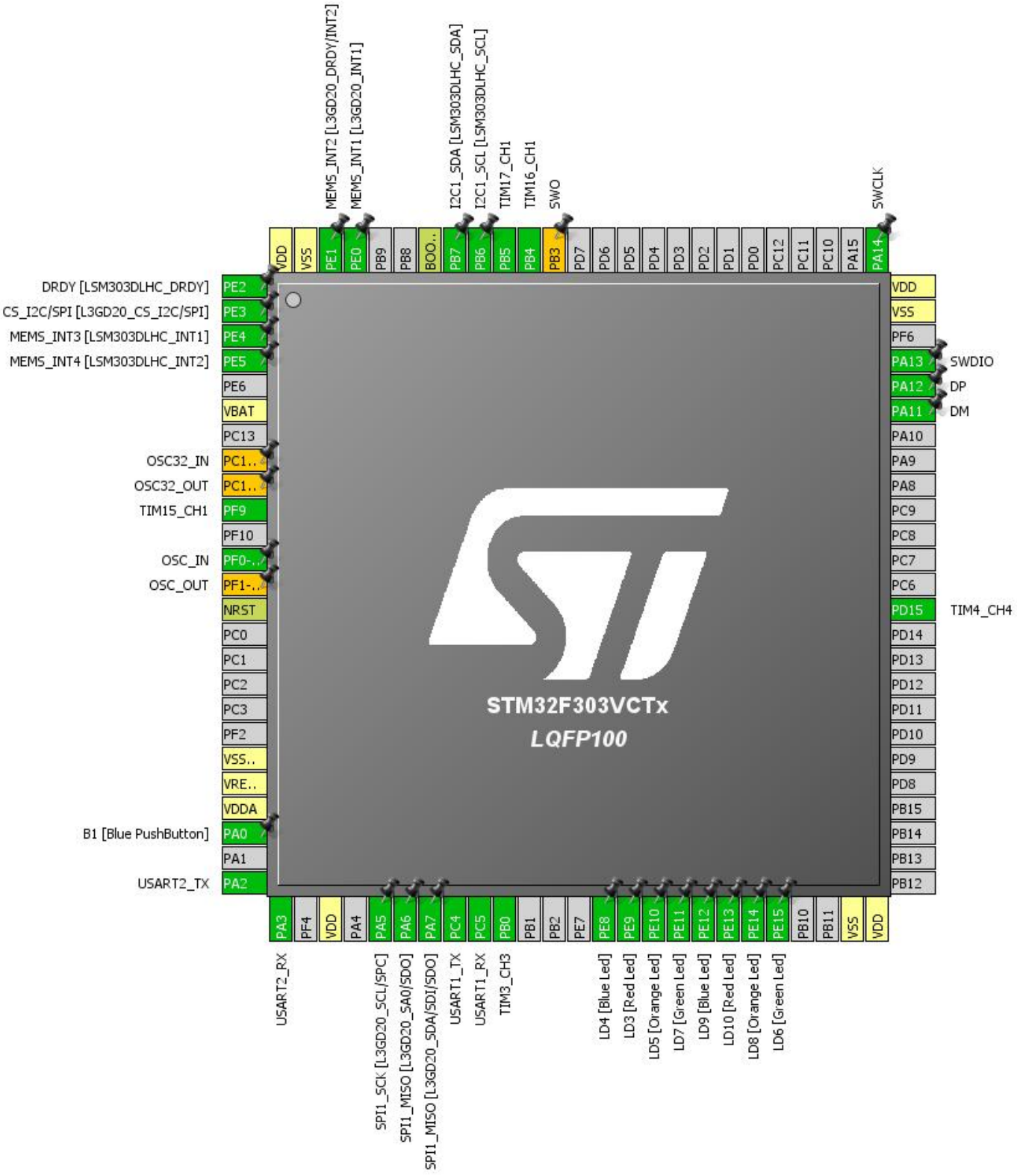
1.1. Project

Project Name	StepperTest
Board Name	STM32F3DISCOVERY
Generated with:	STM32CubeMX 4.27.0
Date	09/18/2019

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

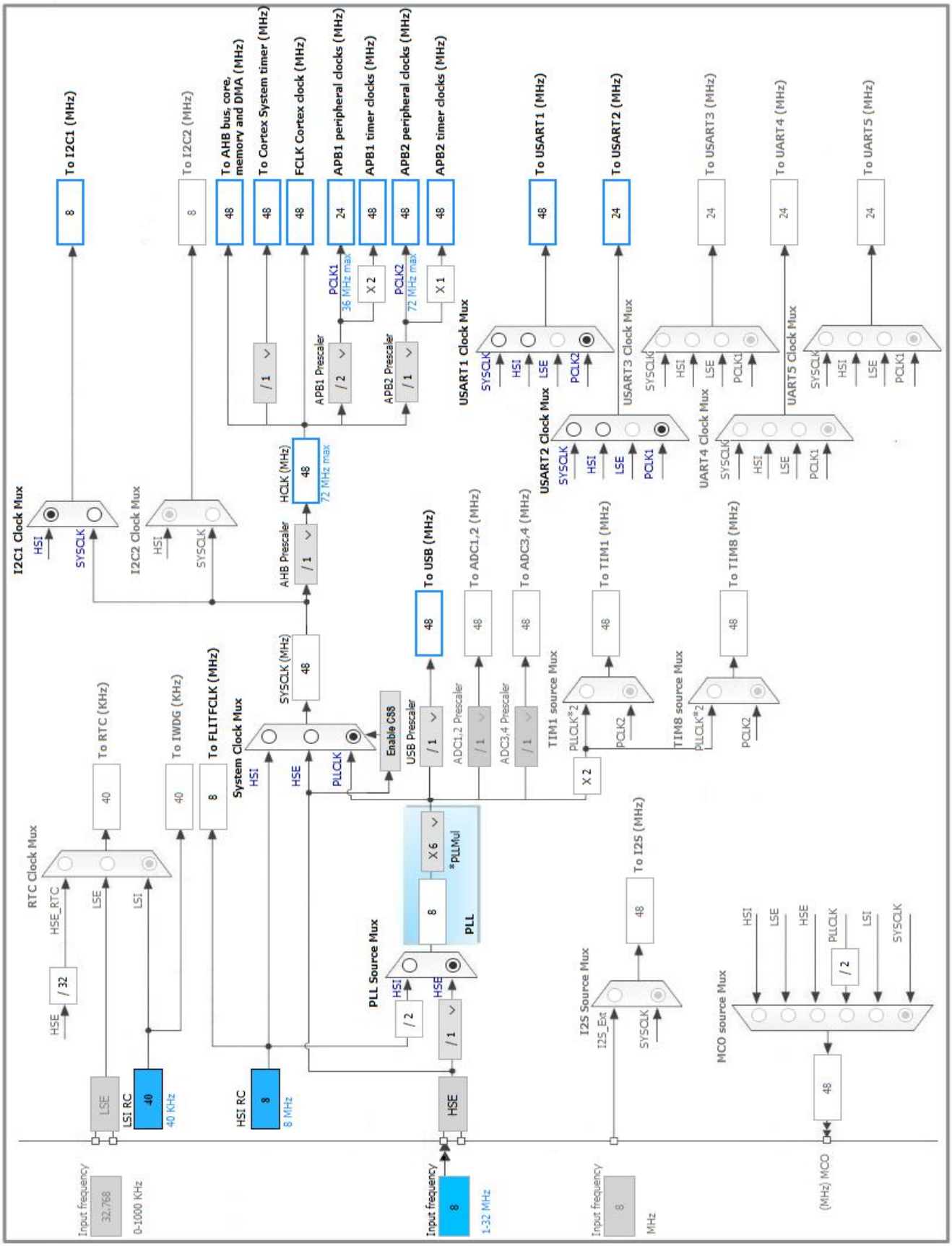
Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	PE2	I/O	GPIO_EXTI2	DRDY [LSM303DLHC_DRDY]
2	PE3 *	I/O	GPIO_Output	CS_I2C/SPI [L3GD20_CS_I2C/SPI]
3	PE4	I/O	GPIO_EXTI4	MEMS_INT3 [LSM303DLHC_INT1]
4	PE5	I/O	GPIO_EXTI5	MEMS_INT4 [LSM303DLHC_INT2]
6	VBAT	Power		
8	PC14-OSC32_IN **	I/O	RCC_OSC32_IN	OSC32_IN
9	PC15-OSC32_OUT **	I/O	RCC_OSC32_OUT	OSC32_OUT
10	PF9	I/O	TIM15_CH1	
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_Input	B1 [Blue PushButton]
25	PA2	I/O	USART2_TX	
26	PA3	I/O	USART2_RX	
28	VDD	Power		
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	
35	PB0	I/O	TIM3_CH3	
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]

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
45	PE14 *	I/O	GPIO_Output	LD8 [Orange Led]
46	PE15 *	I/O	GPIO_Output	LD6 [Green Led]
49	VSS	Power		
50	VDD	Power		
62	PD15	I/O	TIM4_CH4	
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
90	PB4	I/O	TIM16_CH1	
91	PB5	I/O	TIM17_CH1	
92	PB6	I/O	I2C1_SCL	I2C1_SCL [LSM303DLHC_SCL]
93	PB7	I/O	I2C1_SDA	I2C1_SDA [LSM303DLHC_SDA]
94	BOOT0	Boot		
97	PE0	I/O	GPIO_EXTI0	MEMS_INT1 [L3GD20_INT1]
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. I2C1

I2C: I2C

5.1.1. Parameter Settings:

Timing configuration:

I2C Speed Mode	Standard Mode
I2C Speed Frequency (KHz)	100
Rise Time (ns)	0
Fall Time (ns)	0
Coefficient of Digital Filter	0
Analog Filter	Enabled
Timing	0x2000090E

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

5.2. RCC

High Speed Clock (HSE): BYPASS Clock Source

5.2.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Prefetch Buffer	Enabled
Flash Latency(WS)	1 WS (2 CPU cycle)

RCC Parameters:

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

5.3. SPI1

Mode: Full-Duplex Master

5.3.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	4 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	**4 ***
Baud Rate	**12.0 MBits/s ***
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSSP Mode	Enabled
NSS Signal Type	Software

5.4. SYS

Debug: Serial Wire

Timebase Source: TIM2

5.5. TIM3

Channel3: PWM Generation CH3

5.5.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	0
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 TRGO	Reset (UG bit from TIMx_EGR)

Clear Input:

Clear Input Source	Disable

PWM Generation Channel 3:

Mode	PWM mode 1
Pulse (16 bits value)	0
Fast Mode	Disable
CH Polarity	High

5.6. TIM4

Channel4: PWM Generation CH4

5.6.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**24 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**200 ***
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 TRGO	Reset (UG bit from TIMx_EGR)

Clear Input:

Clear Input Source	Disable

PWM Generation Channel 4:

Mode	PWM mode 1
Pulse (16 bits value)	0
Fast Mode	Disable
CH Polarity	High

5.7. TIM15

Channel1: PWM Generation CH1

5.7.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**24 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**200 ***
Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 8 bits value)	0

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)

Break And Dead Time management - BRK Configuration:

BRK State	Disable
BRK Polarity	High
BRK Filter (4 bits value)	0

Break And Dead Time management - Output Configuration:

Automatic Output State	Disable
Off State Selection for Run Mode (OSSR)	Disable
Off State Selection for Idle Mode (OSSI)	Disable
Lock Configuration	Off

PWM Generation Channel 1:

Mode	PWM mode 1
Pulse (16 bits value)	0
Fast Mode	Disable
CH Polarity	High
CH Idle State	Reset

5.8. TIM16

mode: Activated

Channel1: PWM Generation CH1

5.8.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**24 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**200 ***
Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 8 bits value)	0
auto-reload preload	Disable

Break And Dead Time management - BRK Configuration:

BRK State	Disable
BRK Polarity	High
BRK Filter (4 bits value)	0

Break And Dead Time management - Output Configuration:

Automatic Output State	Disable
Off State Selection for Run Mode (OSSR)	Disable

Off State Selection for Idle Mode (OSSI)	Disable
Lock Configuration	Off

PWM Generation Channel 1:

Mode	PWM mode 1
Pulse (16 bits value)	0
Fast Mode	Disable
CH Polarity	High
CH Idle State	Reset

5.9. TIM17

mode: Activated

Channel1: PWM Generation CH1

5.9.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**24 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**200 ***
Internal Clock Division (CKD)	No Division
Repetition Counter (RCR - 8 bits value)	0
auto-reload preload	Disable

Break And Dead Time management - BRK Configuration:

BRK State	Disable
BRK Polarity	High
BRK Filter (4 bits value)	0

Break And Dead Time management - Output Configuration:

Automatic Output State	Disable
Off State Selection for Run Mode (OSSR)	Disable
Off State Selection for Idle Mode (OSSI)	Disable
Lock Configuration	Off

PWM Generation Channel 1:

Mode	PWM mode 1
Pulse (16 bits value)	0
Fast Mode	Disable
CH Polarity	High
CH Idle State	Reset

5.10. USART1

Mode: Asynchronous

5.10.1. 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
Single Sample	Disable

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

5.11. USART2

Mode: Asynchronous

5.11.1. 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
Single Sample	Disable

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

5.12. USB

mode: Device (FS)

5.12.1. Parameter Settings:

Basic Parameters:

Speed	Full Speed 12MBit/s
Endpoint 0 Max Packet size	64 Bytes
Physical interface	Internal Phy

Power Parameters:

Low Power	Disabled
Battery Charging	Disabled

5.13. FREERTOS

mode: Enabled

5.13.1. Config parameters:

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	3072
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

Interrupt nesting behaviour configuration:

LIBRARY_LOWEST_INTERRUPT_PRIORITY	15
LIBRARY_MAX_SYSCALL_INTERRUPT_PRIORITY	5

5.13.2. 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

5.14. USB_DEVICE

Class For FS IP: Communication Device Class (Virtual Port Com)

5.14.1. Parameter Settings:

Basic Parameters:

USBD_MAX_NUM_INTERFACES (Maximum number of supported interfaces)	1
USBD_MAX_NUM_CONFIGURATION (Maximum number of supported configuration)	1
USBD_MAX_STR_DESC_SIZ (Maximum size for the string descriptors)	512
USBD_SUPPORT_USER_STRING (Enable user string descriptor)	Disabled
USBD_SELF_POWERED (Enabled self power)	Enabled
USBD_DEBUG_LEVEL (USBD Debug Level)	0: No debug message

Class Parameters:

USB CDC Rx Buffer Size	1000
USB CDC Tx Buffer Size	1000

5.14.2. Device Descriptor:

Device Descriptor:

VID (Vendor IDentifier)	1155
LANGID_STRING (Language Identifier)	English(United States)
MANUFACTURER_STRING (Manufacturer Identifier)	STMicroelectronics

Device Descriptor FS:

PID (Product IDentifier)	22336
PRODUCT_STRING (Product Identifier)	STM32 Virtual ComPort
SERIALNUMBER_STRING (Serial number)	00000000001A

CONFIGURATION_STRING (Configuration Identifier)	CDC Config
INTERFACE_STRING (Interface Identifier)	CDC Interface

*** User modified value**

6. System Configuration

6.1. 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	**High ***	I2C1_SCL [LSM303DLHC_SCL]
	PB7	I2C1_SDA	Alternate Function Open Drain	Pull up	**High ***	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	**High ***	SPI1_SCK [L3GD20_SCL/SPC]
	PA6	SPI1_MISO	Alternate Function Push Pull	No pull up pull down	**High ***	SPI1_MISO [L3GD20_SA0/SDO]
	PA7	SPI1_MOSI	Alternate Function Push Pull	No pull up pull down	**High ***	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
TIM3	PB0	TIM3_CH3	Alternate Function Push Pull	No pull up pull down	Low	
TIM4	PD15	TIM4_CH4	Alternate Function Push Pull	No pull up pull down	Low	
TIM15	PF9	TIM15_CH1	Alternate Function Push Pull	No pull up pull down	Low	
TIM16	PB4	TIM16_CH1	Alternate Function Push Pull	No pull up pull down	Low	
TIM17	PB5	TIM17_CH1	Alternate Function Push Pull	No pull up pull down	Low	
USART1	PC4	USART1_TX	Alternate Function Push Pull	No pull up pull down	**High ***	
	PC5	USART1_RX	Alternate Function Push Pull	No pull up pull down	**High ***	
USART2	PA2	USART2_TX	Alternate Function Push Pull	No pull up pull down	**High ***	
	PA3	USART2_RX	Alternate Function Push Pull	No pull up pull down	**High ***	
USB	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
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
	PB3	SYS_JTDO-TRACESWO	n/a	n/a	n/a	SWO
GPIO	PE2	GPIO_EXTI2	**External Event Mode with Rising edge**	No pull up pull down	n/a	DRDY [LSM303DLHC_DRDY]

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
			trigger detection *			
	PE3	GPIO_Output	Output Push Pull	No pull up pull down	Low	CS_I2C/SPI [L3GD20_CS_I2C/SPI]
	PE4	GPIO_EXTI4	**External Event Mode with Rising edge trigger detection ***	No pull up pull down	n/a	MEMS_INT3 [LSM303DLHC_INT1]
	PE5	GPIO_EXTI5	**External Event Mode with Rising edge trigger detection ***	No pull up pull down	n/a	MEMS_INT4 [LSM303DLHC_INT2]
	PA0	GPIO_Input	Input mode	No pull up pull down	n/a	B1 [Blue PushButton]
	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]
	PE0	GPIO_EXTI0	**External Event Mode with Rising edge trigger detection ***	No pull up pull down	n/a	MEMS_INT1 [L3GD20_INT1]
	PE1	GPIO_EXTI1	**External Event Mode with Rising edge trigger detection ***	No pull up pull down	n/a	MEMS_INT2 [L3GD20_DRDY/INT2]

6.2. DMA configuration

nothing configured in DMA service

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	15	0
System tick timer	true	15	0
USB low priority or CAN_RX0 interrupts	true	5	0
TIM2 global interrupt	true	0	0
PVD interrupt through EXTI line16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
USB high priority or CAN_TX interrupts	unused		
TIM1 break and TIM15 interrupts	unused		
TIM1 update and TIM16 interrupts	unused		
TIM1 trigger, commutation and TIM17 interrupts	unused		
TIM3 global interrupt	unused		
TIM4 global interrupt	unused		
I2C1 event global interrupt / I2C1 wake-up interrupt through EXTI line 23	unused		
I2C1 error interrupt	unused		
SPI1 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		
USB high priority interrupt remap	unused		
USB low priority interrupt remap	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	StepperTest
Project Folder	C:\Users\ASUS\Desktop\Dev_TOOLS\WorksPaceBalancer\GeneratedCode
Toolchain / IDE	MDK-ARM V5
Firmware Package Name and Version	STM32Cube FW_F3 V1.10.0

8.2. Code Generation Settings

Name	Value
STM32Cube Firmware Library Package	Copy all used libraries into the project folder
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)	No

9. Software Pack Report