1. Description

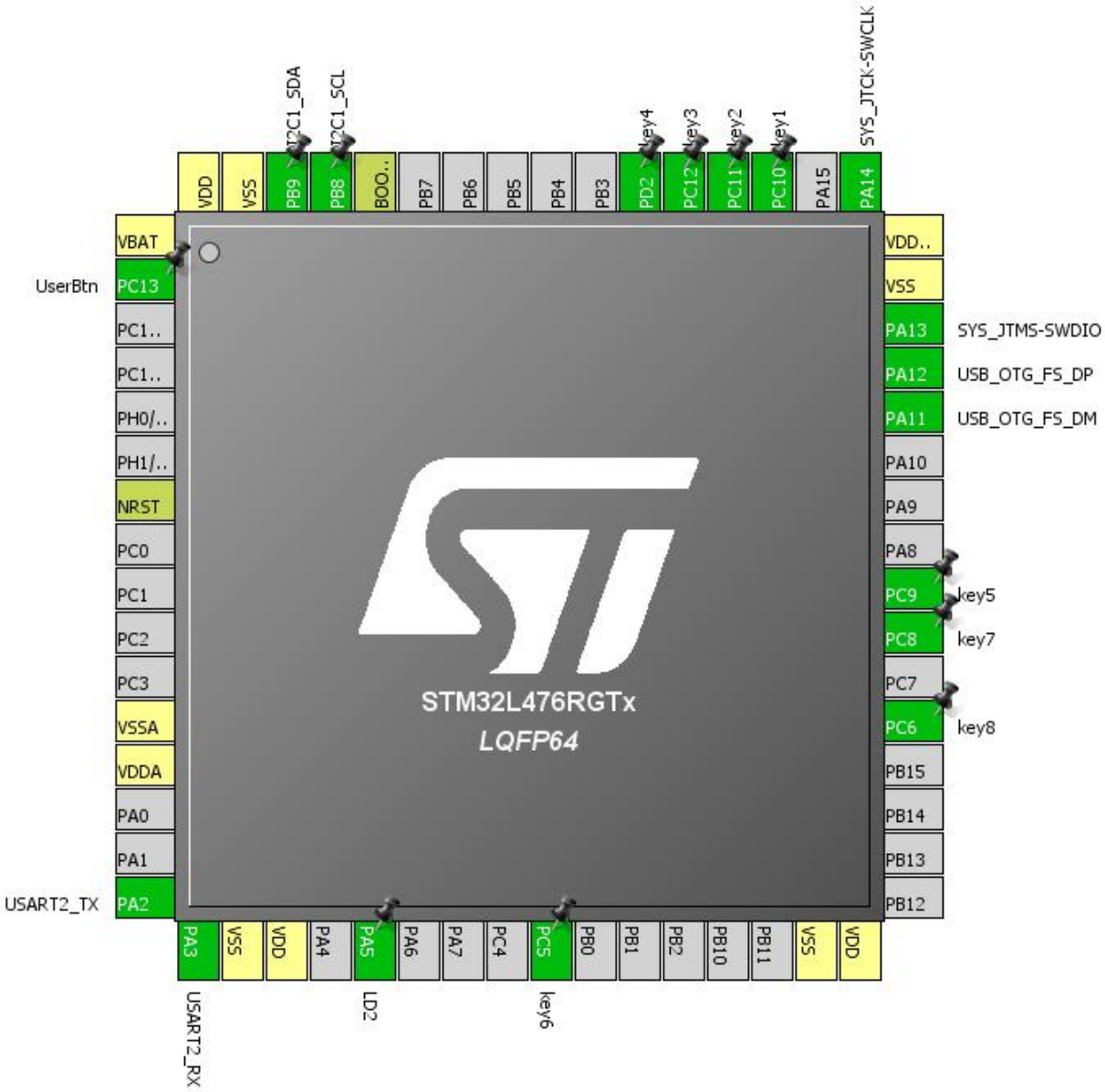
1.1. Project

Project Name	L476USBKeyBoard
Board Name	L476USBKeyBoard
Generated with:	STM32CubeMX 4.19.0
Date	02/26/2017

1.2. MCU

MCU Series	STM32L4
MCU Line	STM32L4x6
MCU name	STM32L476RGTx
MCU Package	LQFP64
MCU Pin number	64

2. Pinout Configuration

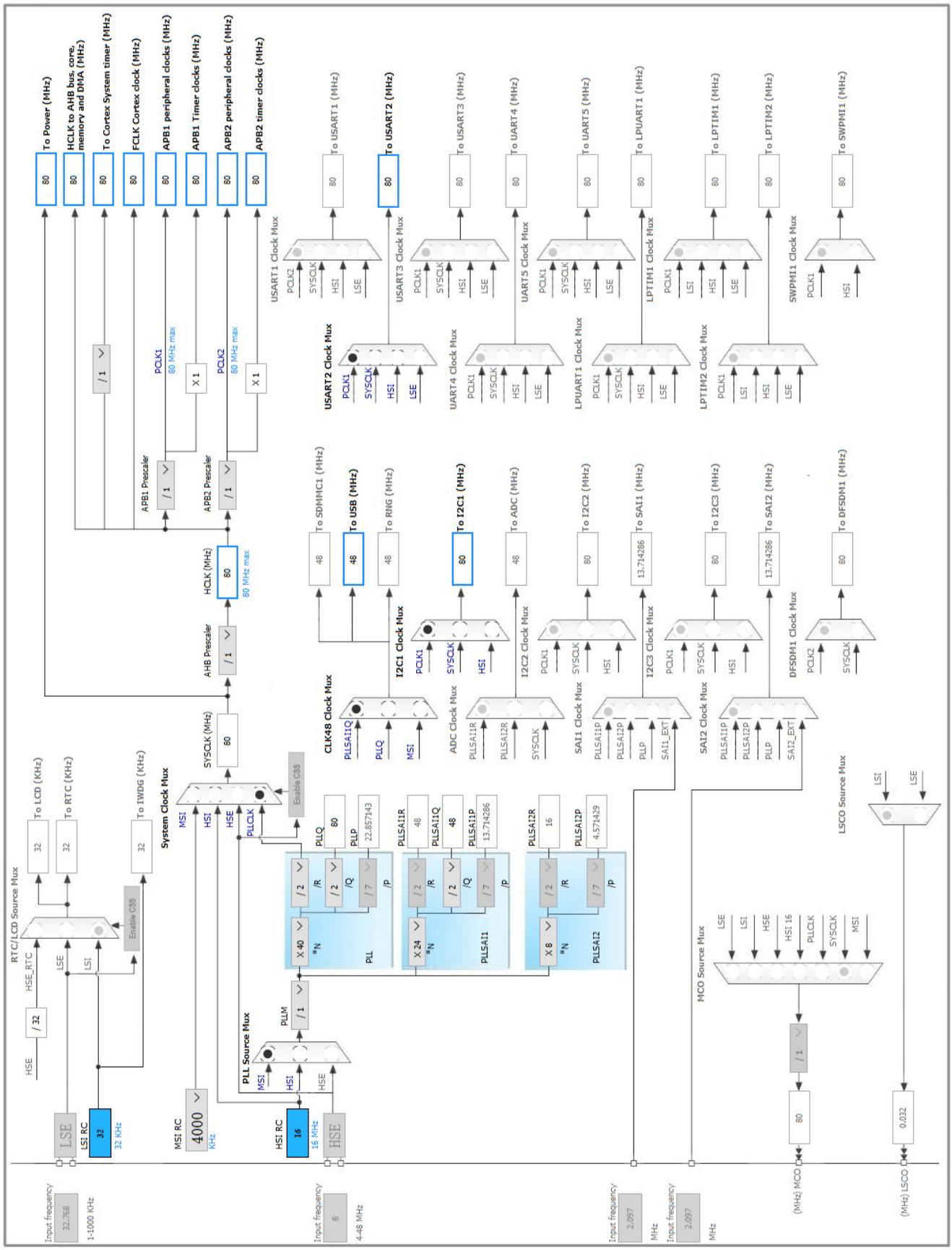


3. Pins Configuration

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
2	PC13 *	I/O	GPIO_Input	UserBtn
7	NRST	Reset		
12	VSSA	Power		
13	VDDA	Power		
16	PA2	I/O	USART2_TX	
17	PA3	I/O	USART2_RX	
18	VSS	Power		
19	VDD	Power		
21	PA5 *	I/O	GPIO_Output	LD2
25	PC5 *	I/O	GPIO_Input	key6
31	VSS	Power		
32	VDD	Power		
37	PC6 *	I/O	GPIO_Input	key8
39	PC8 *	I/O	GPIO_Input	key7
40	PC9 *	I/O	GPIO_Input	key5
44	PA11	I/O	USB_OTG_FS_DM	
45	PA12	I/O	USB_OTG_FS_DP	
46	PA13	I/O	SYS_JTMS-SWDIO	
47	VSS	Power		
48	VDDUSB	Power		
49	PA14	I/O	SYS_JTCK-SWCLK	
51	PC10 *	I/O	GPIO_Input	key1
52	PC11 *	I/O	GPIO_Input	key2
53	PC12 *	I/O	GPIO_Input	key3
54	PD2 *	I/O	GPIO_Input	key4
60	BOOT0	Boot		
61	PB8	I/O	I2C1_SCL	
62	PB9	I/O	I2C1_SDA	
63	VSS	Power		
64	VDD	Power		

* The pin is affected with an I/O function

4. Clock Tree Configuration



5. IPs and Middleware Configuration

5.1. I2C1

I2C: I2C

5.1.1. 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	**Disabled ***
Timing	**0x00702D95 ***

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. SYS

Debug: Serial Wire

Timebase Source: SysTick

5.3. TIM6

mode: Activated

5.3.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**79 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**4999 ***

Trigger Output (TRGO) Parameters:

Trigger Event Selection	Reset (UG bit from TIMx_EGR)

5.4. TIM7

mode: Activated

5.4.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**79 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**9999 ***

Trigger Output (TRGO) Parameters:

Trigger Event Selection	Reset (UG bit from TIMx_EGR)

5.5. USART2

Mode: Asynchronous

5.5.1. 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
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

5.6. USB_OTG_FS

Mode: Device_Only

5.6.1. Parameter Settings:

Speed	Full Speed 12MBit/s
Endpoint 0 Max Packet size	64 Bytes
Enable internal IP DMA	Disabled
Low power	Disabled
Link Power Management	Disabled
VBUS sensing	**Disabled ***
Signal start of frame	Disabled

5.7. USB_DEVICE

Class For FS IP: Custom Human Interface Device Class (HID)

5.7.1. Parameter Settings:

Basic Parameters:

VirtualMode	CustomHid
USBD_MAX_NUM_INTERFACES (Maximum number of supported interfaces)	**4 ***
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)	Enabled
USBD_SELF_POWERED (Enabled self power)	Enabled
USBD_DEBUG_LEVEL (USBD Debug Level)	**3: All messages and internal debug messages are shown ***
USBD_LPM_ENABLED (Link Power Management)	1: Link Power Management supported

Class Parameters:

USBD_CUSTOM_HID_REPORT_DESC_SIZE (Total length for Report descriptor (IN ENDPOINT))	**197 ***
USBD_CUSTOMHID_OUTREPORT_BUF_SIZE (Maximum report buffer size (OUT ENDPOINT))	**64 ***

5.7.2. 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)	**22352 ***
PRODUCT_STRING (Product Identifier)	**KeyBoard-By DQL ***
SERIALNUMBER_STRING (Serial number)	00000000001A
CONFIGURATION_STRING (Configuration Identifier)	Custom HID Config
INTERFACE_STRING (Interface Identifier)	Custom HID 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	PB8	I2C1_SCL	Alternate Function Open Drain	**No pull-up and no pull-down ***	**Very High ***	
	PB9	I2C1_SDA	Alternate Function Open Drain	**No pull-up and no pull-down ***	**Very High ***	
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	**Very High ***	
	PA3	USART2_RX	Alternate Function Push Pull	Pull-up	**Very High ***	
USB_OTG_FS	PA11	USB_OTG_FS_DM	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PA12	USB_OTG_FS_DP	Alternate Function Push Pull	**Pull-up ***	**Very High ***	
GPIO	PC13	GPIO_Input	Input mode	**Pull-up ***	n/a	UserBtn
	PA5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Very High ***	LD2
	PC5	GPIO_Input	Input mode	**Pull-up ***	**n/a**	key6
	PC6	GPIO_Input	Input mode	**Pull-up ***	**n/a**	key8
	PC8	GPIO_Input	Input mode	**Pull-up ***	**n/a**	key7
	PC9	GPIO_Input	Input mode	**Pull-up ***	**n/a**	key5
	PC10	GPIO_Input	Input mode	**Pull-up ***	**n/a**	key1
	PC11	GPIO_Input	Input mode	**Pull-up ***	**n/a**	key2
	PC12	GPIO_Input	Input mode	**Pull-up ***	**n/a**	key3
	PD2	GPIO_Input	Input mode	**Pull-up ***	**n/a**	key4

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
Prefetch 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
TIM6 global interrupt, DAC channel1 and channel2 underrun error interrupts	true	0	0
TIM7 global interrupt	true	0	0
USB OTG FS global interrupt	true	0	0
PVD/PVM1/PVM2/PVM3/PVM4 interrupts through EXTI lines 16/35/36/37/38	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
I2C1 event interrupt	unused		
I2C1 error interrupt	unused		
USART2 global interrupt	unused		
FPU global interrupt	unused		

*** User modified value**

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32L4
Line	STM32L4x6
MCU	STM32L476RGTx
Datasheet	025976_Rev4

7.2. Parameter Selection

Temperature	25
Vdd	null

8. Software Project

8.1. Project Settings

Name	Value
Project Name	L476USBKeyBoard
Project Folder	C:\Users\DengQ\Desktop\stm32+mpu9250usb hid-release\L476USB-HIDMulti -
Toolchain / IDE	EWARM
Firmware Package Name and Version	STM32Cube FW_L4 V1.6.0

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	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