

1. Description

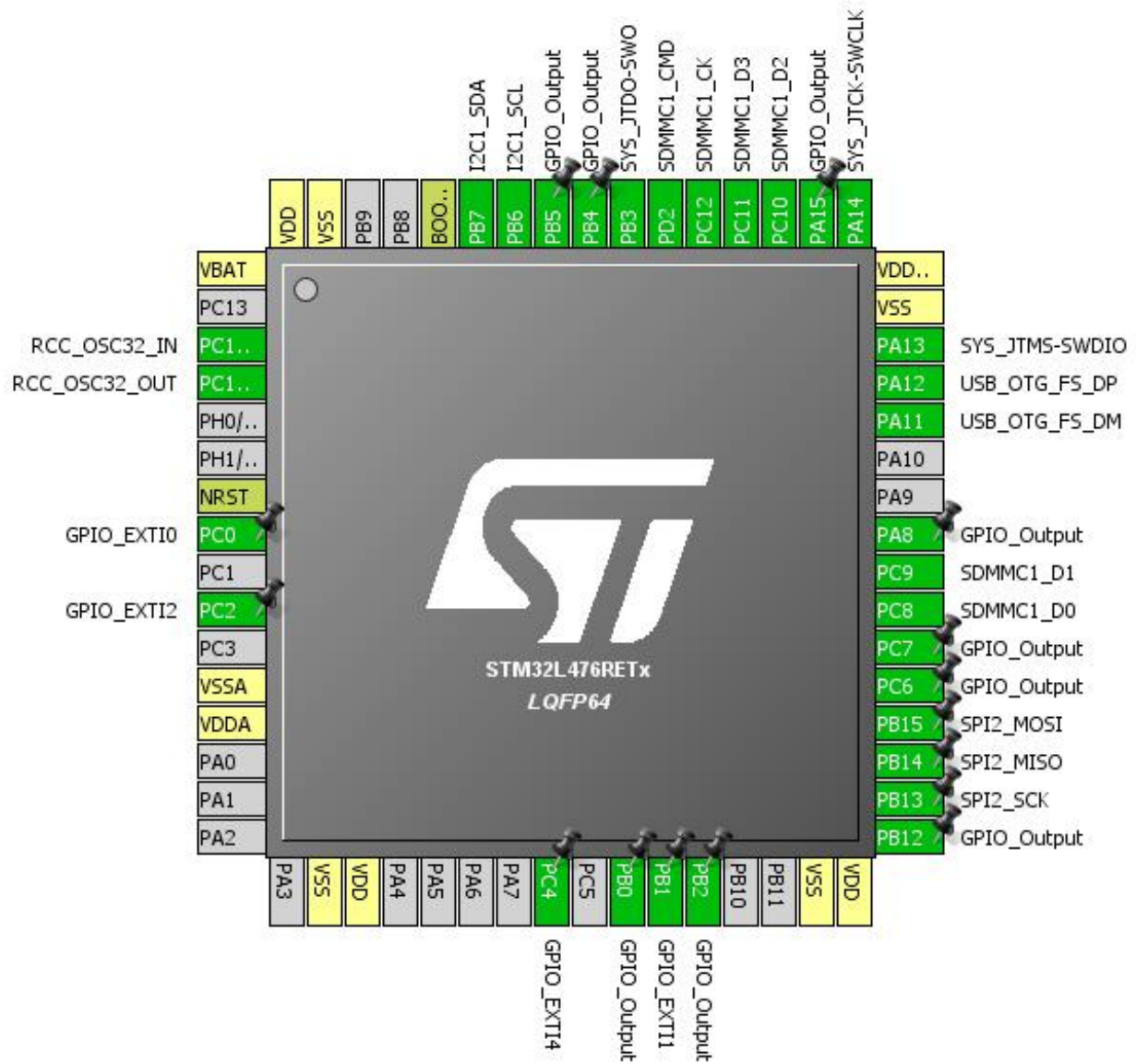
1.1. Project

Project Name	yetimote_full_I4
Board Name	yetimote_full_I4
Generated with:	STM32CubeMX 4.18.0
Date	01/20/2017

1.2. MCU

MCU Series	STM32L4
MCU Line	STM32L4x6
MCU name	STM32L476RETx
MCU Package	LQFP64
MCU Pin number	64

2. Pinout Configuration



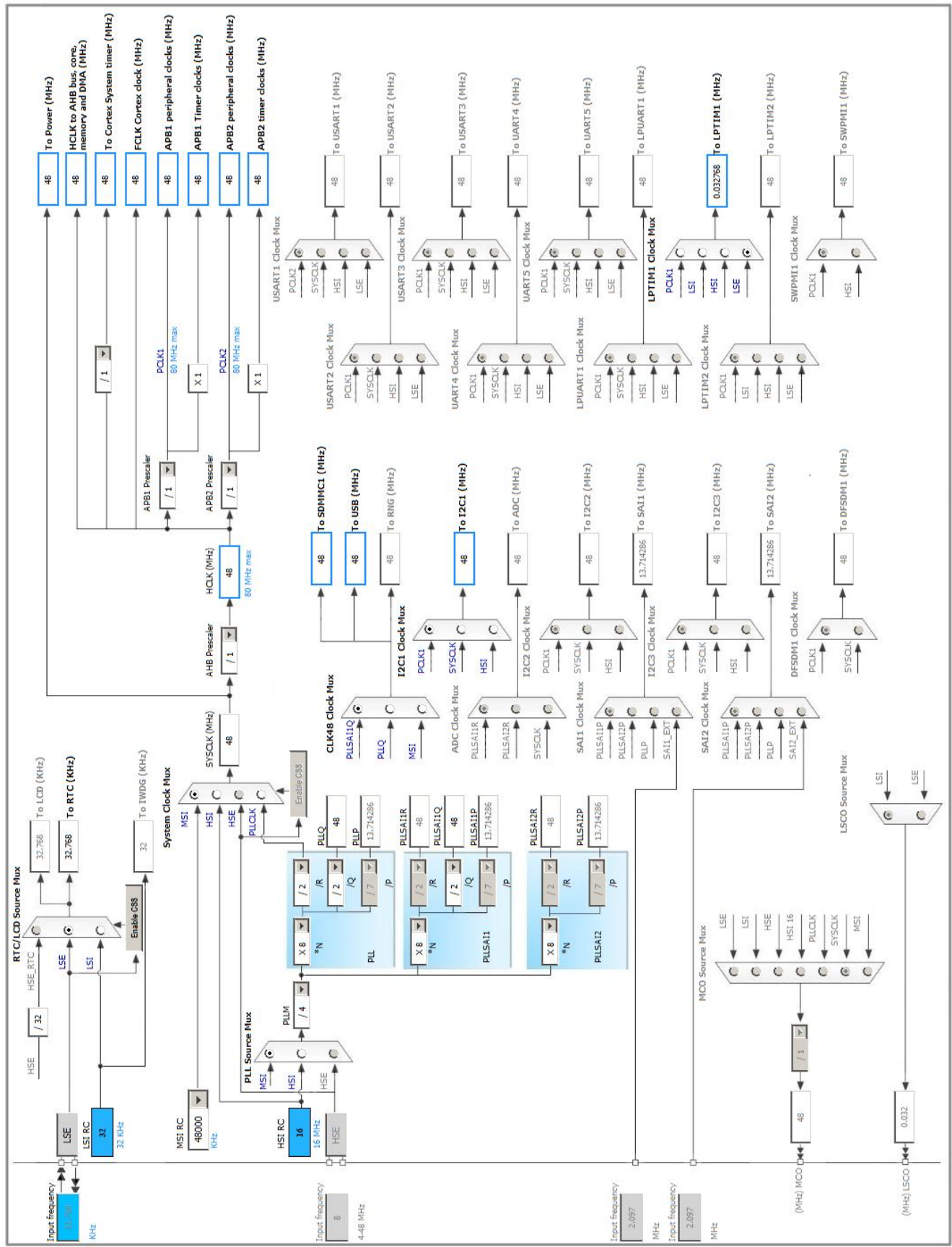
3. Pins Configuration

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
3	PC14/OSC32_IN	I/O	RCC_OSC32_IN	
4	PC15/OSC32_OUT	I/O	RCC_OSC32_OUT	
7	NRST	Reset		
8	PC0	I/O	GPIO_EXTI0	
10	PC2	I/O	GPIO_EXTI2	
12	VSSA	Power		
13	VDDA	Power		
18	VSS	Power		
19	VDD	Power		
24	PC4	I/O	GPIO_EXTI4	
26	PB0 *	I/O	GPIO_Output	
27	PB1	I/O	GPIO_EXTI1	
28	PB2 *	I/O	GPIO_Output	
31	VSS	Power		
32	VDD	Power		
33	PB12 *	I/O	GPIO_Output	
34	PB13	I/O	SPI2_SCK	
35	PB14	I/O	SPI2_MISO	
36	PB15	I/O	SPI2_MOSI	
37	PC6 *	I/O	GPIO_Output	
38	PC7 *	I/O	GPIO_Output	
39	PC8	I/O	SDMMC1_D0	
40	PC9	I/O	SDMMC1_D1	
41	PA8 *	I/O	GPIO_Output	
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	
50	PA15 *	I/O	GPIO_Output	
51	PC10	I/O	SDMMC1_D2	
52	PC11	I/O	SDMMC1_D3	
53	PC12	I/O	SDMMC1_CK	
54	PD2	I/O	SDMMC1_CMD	

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
55	PB3	I/O	SYS_JTDO-SWO	
56	PB4 *	I/O	GPIO_Output	
57	PB5 *	I/O	GPIO_Output	
58	PB6	I/O	I2C1_SCL	
59	PB7	I/O	I2C1_SDA	
60	BOOT0	Boot		
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	Enabled
Timing	0x2010091A *

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. LPTIM1

Mode: Counts internal clock events

5.2.1. Parameter Settings:

Clock:

Clock Prescaler	Prescaler Div1
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Preload:

Update Mode	Update Immediate
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Trigger:

Trigger Source	Software Trigger
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5.3. RCC

Low Speed Clock (LSE) : Crystal/Ceramic Resonator

5.3.1. 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	16
MSI Calibration Value	0
MSI Auto Calibration	Enabled
HSE Startup Timeout Value (ms)	100
LSE Startup Timeout Value (ms)	5000

Power Parameters:

Power Regulator Voltage Scale	Power Regulator Voltage Scale 1
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5.4. RTC

mode: Activate Clock Source

mode: Activate Calendar

Alarm A: Internal Alarm A

5.4.1. Parameter Settings:

General:

Hour Format	Hourformat 24
Asynchronous Predivider value	33 *
Synchronous Predivider value	993 *

Calendar Time:

Data Format	Binary data format *
Hours	12 *
Minutes	30 *
Seconds	0
Day Light Saving: value of hour adjustment	Daylightsaving None

Store Operation

Storeoperation Reset

Calendar Date:

Week Day

Wednesday *

Month

October *

Date

5 *

Year

16 *

Alarm A:

Hours

0

Minutes

0

Seconds

0

Sub Seconds

0

Alarm Mask Date Week day

Disable

Alarm Mask Hours

Disable

Alarm Mask Minutes

Disable

Alarm Mask Seconds

Disable

Alarm Sub Second Mask

All Alarm SS fields are masked.

Alarm Date Week Day Sel

Date

Alarm Date

1

5.5. SDMMC1

Mode: SD 4 bits Wide bus

5.5.1. Parameter Settings:

SDMMC parameters:

SDMMCCLK clock divide factor

32 *

5.6. SPI2

Mode: Full-Duplex Master

5.6.1. Parameter Settings:

Basic Parameters:

Frame Format

Motorola

Data Size

8 Bits *

First Bit

MSB First

Clock Parameters:

Prescaler (for Baud Rate)	8 *
Baud Rate	6.0 MBits/s *
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSSP Mode	Enabled
NSS Signal Type	Software

5.7. SYS

Debug: Trace Asynchronous Sw

Timebase Source: TIM8

5.8. USB_OTG_FS

Mode: Device_Only

5.8.1. 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	Enabled
Signal start of frame	Disabled

5.9. FATFS

mode: SD Card

5.9.1. Set Defines:

Version:

FATFS version	R0.11
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Function Parameters:

FS_TINY (Tiny mode)	Disabled
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FS_READONLY (Read-only mode)	Disabled
FS_MINIMIZE (Minimization level)	Disabled
USE_STRFUNC (String functions)	Enabled with LF -> CRLF conversion
USE_FIND (Find functions)	Disabled
USE_MKFS (Make filesystem function)	Enabled
USE_FORWARD (Forward function)	Disabled
USE_LABEL (Volume label functions)	Disabled
USE_FASTSEEK (Fast seek function)	Enabled

Locale and Namespace Parameters:

CODE_PAGE (Code page on target)	Latin 1 (Windows)
USE_LFN (Use Long Filename)	Disabled
MAX_LFN (Max Long Filename)	255
LFN_UNICODE (Enable Unicode)	ANSI/OEM
STRF_ENCODE (Character encoding)	UTF-8
FS_RPATH (Relative Path)	Disabled

Physical Drive Parameters:

VOLUMES (Logical drives)	1
MAX_SS (Maximum Sector Size)	512
MIN_SS (Minimum Sector Size)	512
MULTI_PARTITION (Volume partitions feature)	Disabled
USE_TRIM (Erase feature)	Disabled
FS_NOFSINFO (Force full FAT scan)	0

System Parameters:

FS_NORTC (Timestamp feature)	Dynamic timestamp
NORTC_YEAR (Year for timestamp)	2015
NORTC_MON (Month for timestamp)	6
NORTC_MDAY (Day for timestamp)	4
WORD_ACCESS (Platform dependent access option)	Byte access
FS_REENTRANT (Re-Entrancy)	Enabled
FS_TIMEOUT (Timeout ticks)	1000
SYNC_t (O/S sync object)	osSemaphoreId
FS_LOCK (Number of files opened simultaneously)	2

5.9.2. IPs instances:

SDIO/SDMMC:

SDMMC instance	SDMMC1
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5.10. FREERTOS

mode: Enabled

5.10.1. Config parameters:

Versions:

CMSIS-RTOS version	1.02
FreeRTOS version	8.2.3

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
TOTAL_HEAP_SIZE	81920 *
Memory Management scheme	heap_4
USE_ALTERNATIVE_API	Disabled
ENABLE_BACKWARD_COMPATIBILITY	Enabled
USE_PORT_OPTIMISED_TASK_SELECTION	Disabled
USE_TICKLESS_IDLE	Enabled *
USE_TASK_NOTIFICATIONS	Enabled

Hook function related definitions:

USE_IDLE_HOOK	Disabled
USE_TICK_HOOK	Disabled
USE_MALLOC_FAILED_HOOK	Enabled *
CHECK_FOR_STACK_OVERFLOW	Option2 *

Run time and task stats gathering related definitions:

USE_TRACE_FACILITY	Enabled
GENERATE_RUN_TIME_STATS	Disabled

Co-routine related definitions:

USE_CO_ROUTINES	Disabled
MAX_CO_ROUTINE_PRIORITIES	2

Software timer definitions:

USE_TIMERS	Enabled *
TIMER_TASK_PRIORITY	6 *
TIMER_QUEUE_LENGTH	16 *
TIMER_TASK_STACK_DEPTH	256

Interrupt nesting behaviour configuration:

LIBRARY_LOWEST_INTERRUPT_PRIORITY	15
LIBRARY_MAX_SYSCALL_INTERRUPT_PRIORITY	5

5.10.2. 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

5.11. USB_DEVICE

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

5.11.1. 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
USBD_LPM_ENABLED (Link Power Management)	1: Link Power Management supported

Class Parameters:

USBD_CDC_INTERVAL (Number of micro-frames interval)	1000
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5.11.2. 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 YETIMOTE 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	Very High *	
	PB7	I2C1_SDA	Alternate Function Open Drain	Pull-up	Very High *	
RCC	PC14/OSC32_IN	RCC_OSC32_IN	n/a	n/a	n/a	
	PC15/OSC32_OUT	RCC_OSC32_OUT	n/a	n/a	n/a	
SDMMC1	PC8	SDMMC1_D0	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PC9	SDMMC1_D1	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PC10	SDMMC1_D2	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PC11	SDMMC1_D3	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PC12	SDMMC1_CK	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PD2	SDMMC1_CMD	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
SPI2	PB13	SPI2_SCK	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PB14	SPI2_MISO	Alternate Function Push Pull	No pull-up and no pull-down	Very High *	
	PB15	SPI2_MOSI	Alternate Function Push Pull	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	
	PB3	SYS_JTDO-SWO	n/a	n/a	n/a	
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	No pull-up and no pull-down	Very High *	
GPIO	PC0	GPIO_EXTI0	External Interrupt Mode with Falling edge trigger detection	No pull-up and no pull-down	n/a	

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PC2	GPIO_EXTI2	External Interrupt Mode with Falling edge trigger detection	No pull-up and no pull-down	n/a	
	PC4	GPIO_EXTI4	External Interrupt Mode with Falling edge trigger detection	No pull-up and no pull-down	n/a	
	PB0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Very High *	
	PB1	GPIO_EXTI1	External Interrupt Mode with Falling edge trigger detection	No pull-up and no pull-down	n/a	
	PB2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Very High *	
	PB12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Very High *	
	PC6	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PC7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PA8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PA15	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PB4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	
	PB5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	

6.2. DMA configuration

DMA request	Stream	Direction	Priority
I2C1_RX	DMA1_Channel7	Peripheral To Memory	Low
I2C1_TX	DMA1_Channel6	Memory To Peripheral	Low
SPI2_RX	DMA1_Channel4	Peripheral To Memory	Medium *
SPI2_TX	DMA1_Channel5	Memory To Peripheral	Medium *

I2C1_RX: DMA1_Channel7 DMA request Settings:

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

I2C1_TX: DMA1_Channel6 DMA request Settings:

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

SPI2_RX: DMA1_Channel4 DMA request Settings:

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

SPI2_TX: DMA1_Channel5 DMA request Settings:

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

Memory Data Width: Byte

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	15	0
System tick timer	true	15	0
EXTI line0 interrupt	true	7	0
EXTI line1 interrupt	true	14	0
EXTI line2 interrupt	true	7	0
EXTI line4 interrupt	true	7	0
DMA1 channel4 global interrupt	true	7	0
DMA1 channel5 global interrupt	true	7	0
DMA1 channel6 global interrupt	true	8	0
DMA1 channel7 global interrupt	true	8	0
TIM8 update interrupt	true	0	0
USB OTG FS global interrupt	true	5	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		
SPI2 global interrupt	unused		
RTC alarm interrupt through EXTI line 18	unused		
SDMMC1 global interrupt	unused		
LPTIM1 global interrupt	unused		
FPU global interrupt	unused		

* User modified value

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32L4
Line	STM32L4x6
MCU	STM32L476RETx
Datasheet	025976_Rev4

7.2. Parameter Selection

Temperature	25
Vdd	null

8. Software Project

8.1. Project Settings

Name	Value
Project Name	yetimote_full_I4
Project Folder	D:\Repos\git_easysafe\SW\yetimote_full\yetimote_full_I4\yetimote_full_I4
Toolchain / IDE	SW4STM32
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