1. Description

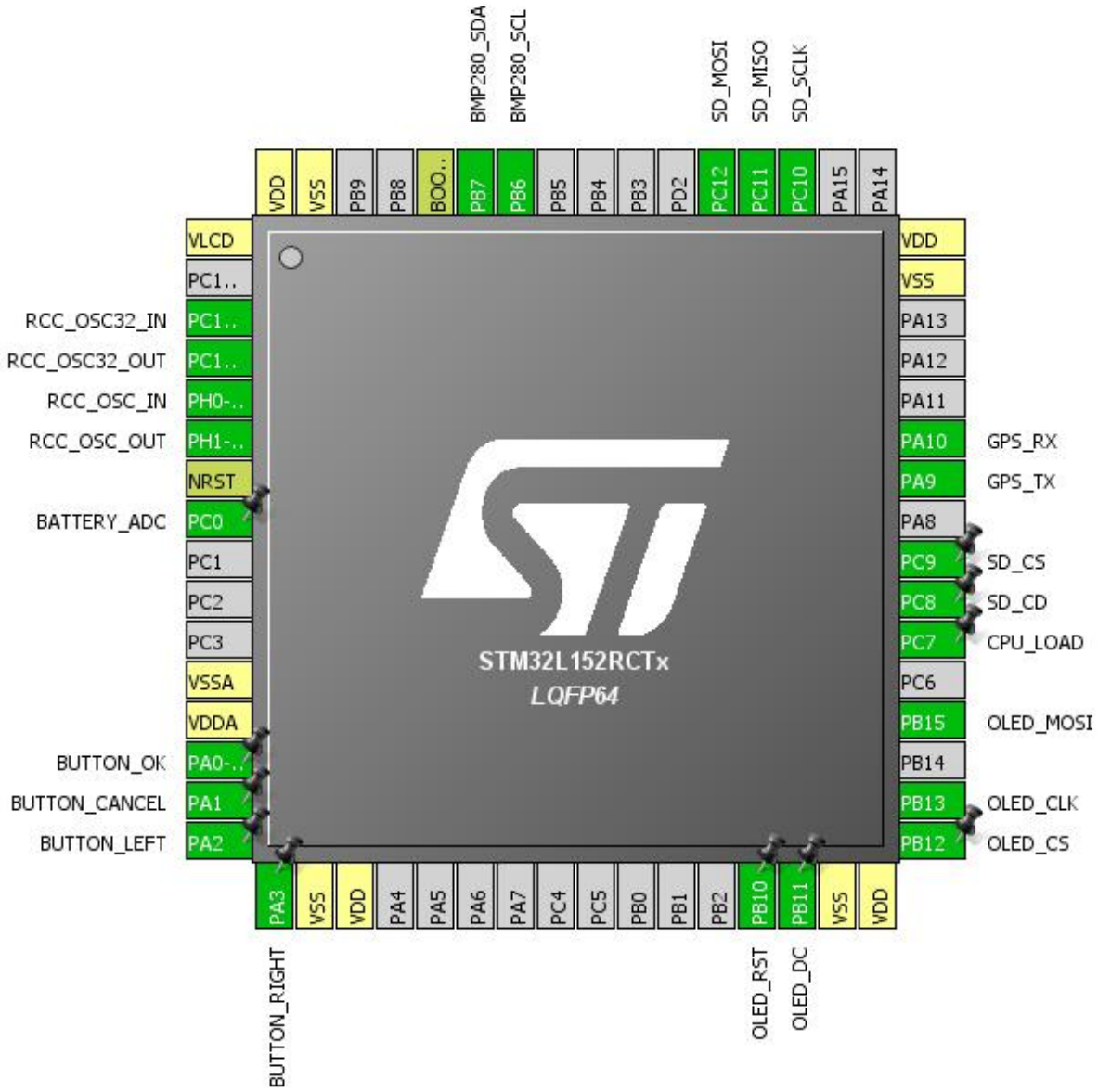
1.1. Project

Project Name	CyclingComputer
Board Name	custom
Generated with:	STM32CubeMX 4.27.0
Date	02/28/2019

1.2. MCU

MCU Series	STM32L1
MCU Line	STM32L151/152
MCU name	STM32L152RCTx
MCU Package	LQFP64
MCU Pin number	64

2. Pinout Configuration



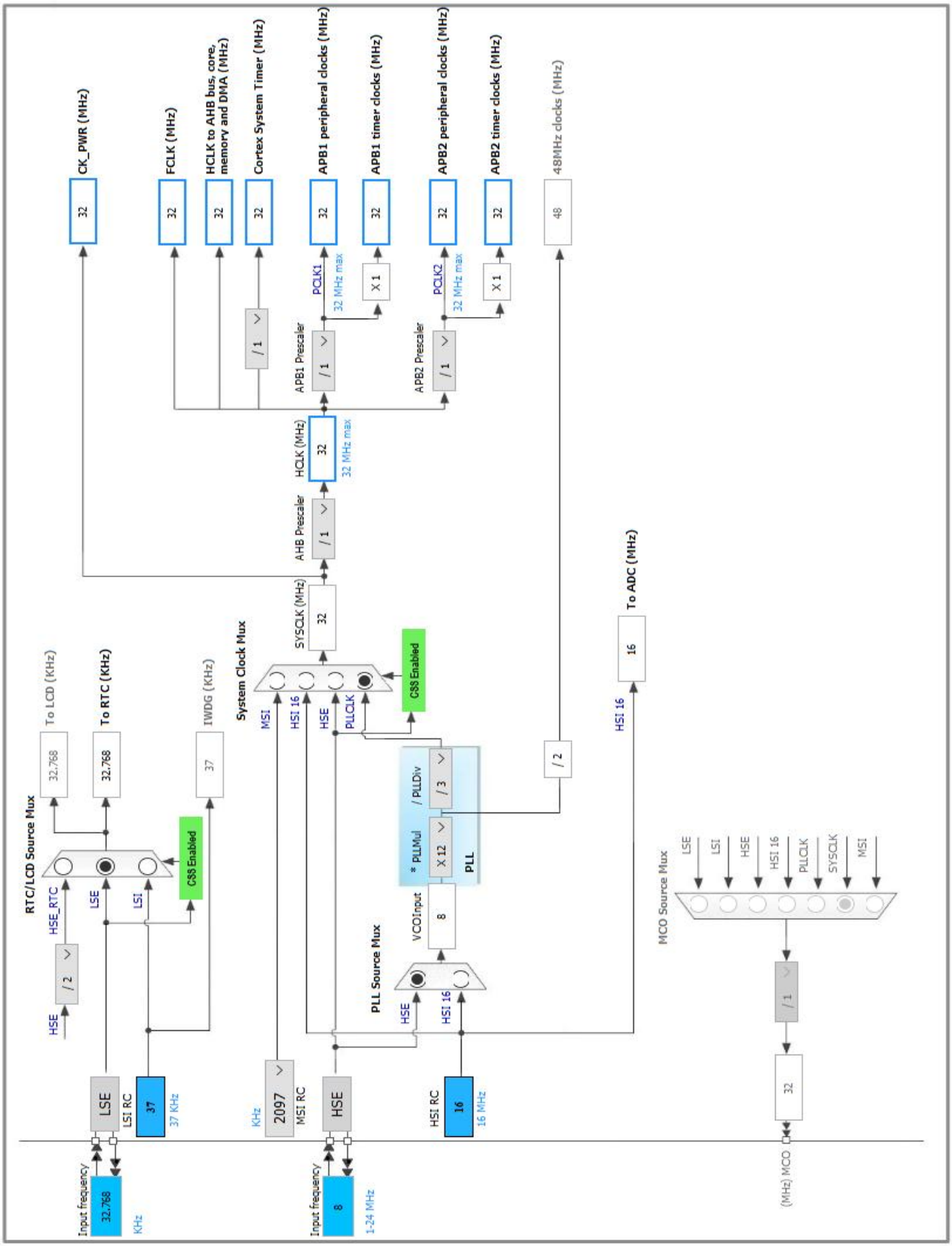
3. Pins Configuration

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VLCD	Power		
3	PC14-OSC32_IN	I/O	RCC_OSC32_IN	
4	PC15-OSC32_OUT	I/O	RCC_OSC32_OUT	
5	PH0-OSC_IN	I/O	RCC_OSC_IN	
6	PH1-OSC_OUT	I/O	RCC_OSC_OUT	
7	NRST	Reset		
8	PC0	I/O	ADC_IN10	BATTERY_ADC
12	VSSA	Power		
13	VDDA	Power		
14	PA0-WKUP1	I/O	GPIO_EXTI0	BUTTON_OK
15	PA1 *	I/O	GPIO_Input	BUTTON_CANCEL
16	PA2 *	I/O	GPIO_Input	BUTTON_LEFT
17	PA3 *	I/O	GPIO_Input	BUTTON_RIGHT
18	VSS	Power		
19	VDD	Power		
29	PB10 *	I/O	GPIO_Output	OLED_RST
30	PB11 *	I/O	GPIO_Output	OLED_DC
31	VSS	Power		
32	VDD	Power		
33	PB12 *	I/O	GPIO_Output	OLED_CS
34	PB13	I/O	SPI2_SCK	OLED_CLK
36	PB15	I/O	SPI2_MOSI	OLED_MOSI
38	PC7 *	I/O	GPIO_Output	CPU_LOAD
39	PC8 *	I/O	GPIO_Input	SD_CD
40	PC9 *	I/O	GPIO_Output	SD_CS
42	PA9	I/O	USART1_TX	GPS_TX
43	PA10	I/O	USART1_RX	GPS_RX
47	VSS	Power		
48	VDD	Power		
51	PC10	I/O	SPI3_SCK	SD_SCLK
52	PC11	I/O	SPI3_MISO	SD_MISO
53	PC12	I/O	SPI3_MOSI	SD_MOSI
58	PB6	I/O	I2C1_SCL	BMP280_SCL
59	PB7	I/O	I2C1_SDA	BMP280_SDA
60	BOOT0	Boot		
63	VSS	Power		

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
64	VDD	Power		

* The pin is affected with an I/O function

4. Clock Tree Configuration



5. IPs and Middleware Configuration

5.1. ADC

mode: IN10

5.1.1. Parameter Settings:

ADC_Settings:

Clock Prescaler	**Asynchronous clock mode divided by 4 ***
Resolution	ADC 12-bit resolution
Data Alignment	Right alignment
Scan Mode	Disabled
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	Disabled
End Of Conversion Selection	**End of single conversion ***
Low Power Auto Wait	Disabled
Low Power Auto Off	**power off when ADC is not converting ***

ADC_Regular_ConversionMode:

Number Of Conversion	1
External Trigger Conversion Source	Regular Conversion launched by software
External Trigger Conversion Edge	None
Rank	1
Channel	Channel 10
Sampling Time	**384 Cycles ***

ADC_Injected_ConversionMode:

Number Of Conversions	0

WatchDog:

Enable Analog WatchDog Mode	false

5.2. I2C1

I2C: I2C

5.2.1. Parameter Settings:

Master Features:

I2C Speed Mode	**Fast Mode ***
I2C Clock Speed (Hz)	400000
Fast Mode Duty Cycle	Duty cycle Tlow/Thigh = 2

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

5.3. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

Low Speed Clock (LSE) : Crystal/Ceramic Resonator

5.3.1. Parameter Settings:

System Parameters:

VDD voltage (V)	**3 ***
Instruction Cache	Enabled
Prefetch Buffer	Disabled
Data Cache	Enabled
Flash Latency(WS)	1 WS (2 CPU cycle)

RCC Parameters:

HSI Calibration Value	16
MSI Calibration Value	0
HSE Startup Timout Value (ms)	100
LSE Startup Timout Value (ms)	5000

Power Parameters:

Power Regulator Voltage Scale	Power Regulator Voltage Scale 1

5.4. RTC

mode: Activate Clock Source

mode: Activate Calendar

5.4.1. Parameter Settings:

General:

Hour Format	Hourformat 24
Asynchronous Predivider value	127
Synchronous Predivider value	255

Calendar Time:

Data Format	**Binary data format ***

Hours	0
Minutes	0
Seconds	0
Day Light Saving: value of hour adjustment	Daylightsaving None
Store Operation	Storeoperation Reset

Calendar Date:

Week Day	**Tuesday ***
Month	January
Date	1
Year	**39 ***

5.5. SPI2

Mode: Transmit Only Master

5.5.1. Parameter Settings:

Basic Parameters:

Frame Format	Motorola
Data Size	8 Bits
First Bit	MSB First

Clock Parameters:

Prescaler (for Baud Rate)	2
Baud Rate	**16.0 MBits/s ***
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSS Signal Type	Software

5.6. SPI3

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)	2
Baud Rate	**16.0 MBits/s ***
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

Advanced Parameters:

CRC Calculation	Disabled
NSS Signal Type	Software

5.7. SYS

Timebase Source: SysTick

5.8. TIM10

Clock Source : Internal Clock

5.8.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**31 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**999 ***
Internal Clock Division (CKD)	No Division

5.9. TIM11

Clock Source : Internal Clock

5.9.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**31000 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**999 ***
Internal Clock Division (CKD)	No Division

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

5.11. FATFS

mode: User-defined

5.11.1. Set Defines:

Version:

FATFS version	R0.11

Function Parameters:

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_FASTSEEK (Fast seek function)	Enabled
USE_LABEL (Volume label functions)	Disabled
USE_FORWARD (Forward function)	Disabled

Locale and Namespace Parameters:

CODE_PAGE (Code page on target)	Multilingual Latin 1 (OEM)
USE_LFN (Use Long Filename)	**Enabled with static working buffer on the BSS ***
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_TINY (Tiny mode)	Disabled
FS_NORTC (Timestamp feature)	Dynamic timestamp
NORTC_YEAR (Year for timestamp)	**2019 ***
NORTC_MON (Month for timestamp)	**1 ***
NORTC_MDAY (Day for timestamp)	**1 ***
WORD_ACCESS (Platform dependent access option)	Byte access
FS_REENTRANT (Re-Entrancy)	Disabled
FS_TIMEOUT (Timeout ticks)	1000
SYNC_t (O/S sync object)	osSemaphoreId
FS_LOCK (Number of files opened simultaneously)	2

*** User modified value**

6. System Configuration

6.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
ADC	PC0	ADC_IN10	Analog mode	No pull-up and no pull-down	n/a	BATTERY_ADC
I2C1	PB6	I2C1_SCL	Alternate Function Open Drain	**No pull-up and no pull-down ***	**High ***	BMP280_SCL
	PB7	I2C1_SDA	Alternate Function Open Drain	**No pull-up and no pull-down ***	**High ***	BMP280_SDA
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	
	PH0-OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	
	PH1-OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	
SPI2	PB13	SPI2_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	OLED_CLK
	PB15	SPI2_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	OLED_MOSI
SPI3	PC10	SPI3_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	SD_SCLK
	PC11	SPI3_MISO	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	SD_MISO
	PC12	SPI3_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	SD_MOSI
USART1	PA9	USART1_TX	Alternate Function Push Pull	Pull-up	**High ***	GPS_TX
	PA10	USART1_RX	Alternate Function Push Pull	Pull-up	**High ***	GPS_RX
GPIO	PA0-WKUP1	GPIO_EXTI0	External Interrupt Mode with Rising edge trigger detection	No pull-up and no pull-down	n/a	BUTTON_OK
	PA1	GPIO_Input	Input mode	**Pull-up ***	n/a	BUTTON_CANCEL
	PA2	GPIO_Input	Input mode	**Pull-up ***	n/a	BUTTON_LEFT
	PA3	GPIO_Input	Input mode	**Pull-up ***	n/a	BUTTON_RIGHT
	PB10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Low ***	OLED_RST
	PB11	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Low ***	OLED_DC
	PB12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Low ***	OLED_CS
	PC7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**High ***	CPU_LOAD
	PC8	GPIO_Input	Input mode	**Pull-up ***	**n/a**	SD_CD
	PC9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	**Low ***	SD_CS

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	0	0
System tick timer	true	0	0
EXTI line0 interrupt	true	0	0
ADC global interrupt	true	0	0
TIM10 global interrupt	true	0	0
TIM11 global interrupt	true	0	0
USART1 global interrupt	true	1	0
RTC tamper, LSECSS and timestamp interrupts through EXTI line 19	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
I2C1 event interrupt	unused		
I2C1 error interrupt	unused		
SPI2 global interrupt	unused		
SPI3 global interrupt	unused		

*** User modified value**

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32L1
Line	STM32L151/152
MCU	STM32L152RCTx
Datasheet	022799_Rev12

7.2. Parameter Selection

Temperature	25
Vdd	3.0

8. Software Project

8.1. Project Settings

Name	Value
Project Name	CyclingComputer
Project Folder	C:\Users\kal10\workspace\CyclingComputer
Toolchain / IDE	SW4STM32
Firmware Package Name and Version	STM32Cube FW_L1 V1.8.1

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)	No

9. Software Pack Report