1. Description

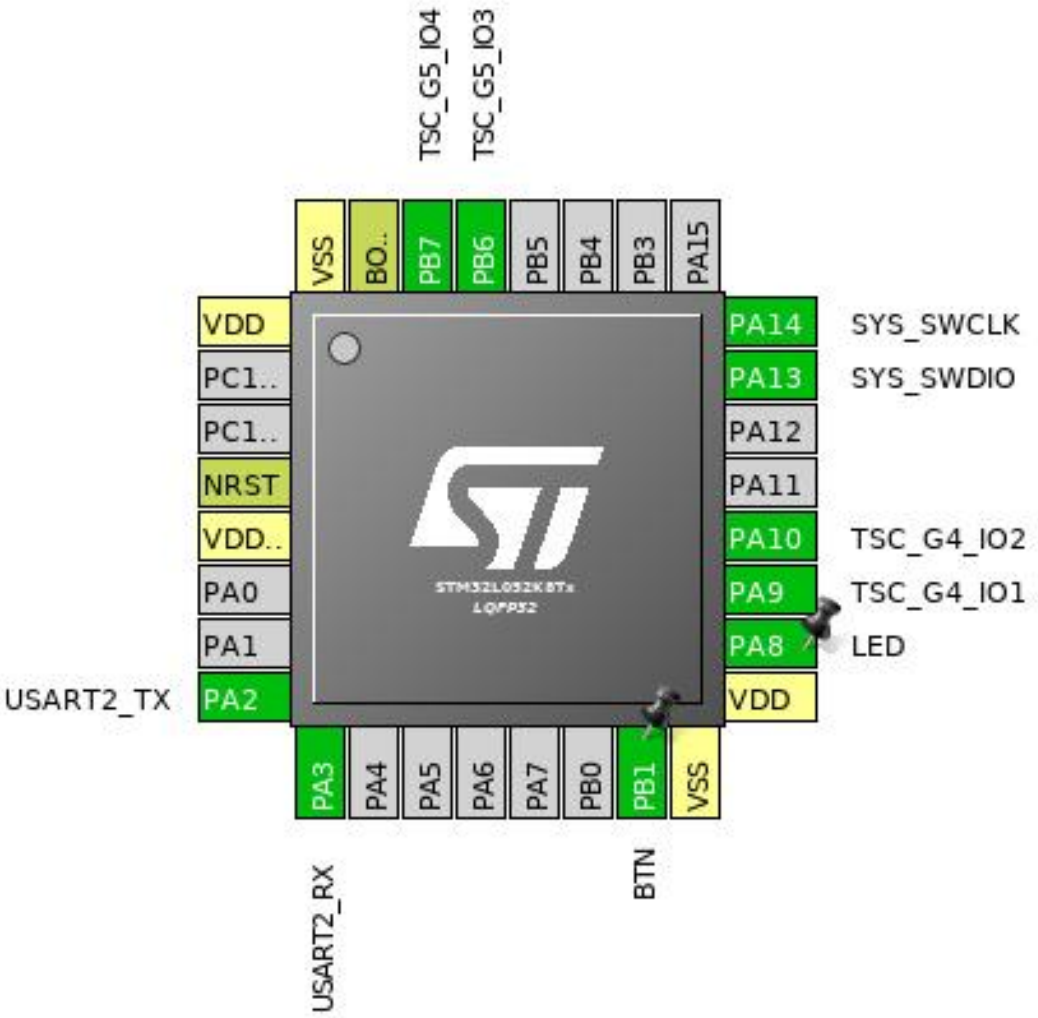
1.1. Project

Project Name	stm32tsc
Board Name	custom
Generated with:	STM32CubeMX 4.27.0
Date	09/24/2018

1.2. MCU

MCU Series	STM32L0
MCU Line	STM32L0x2
MCU name	STM32L052K8Tx
MCU Package	LQFP32
MCU Pin number	32

2. Pinout Configuration

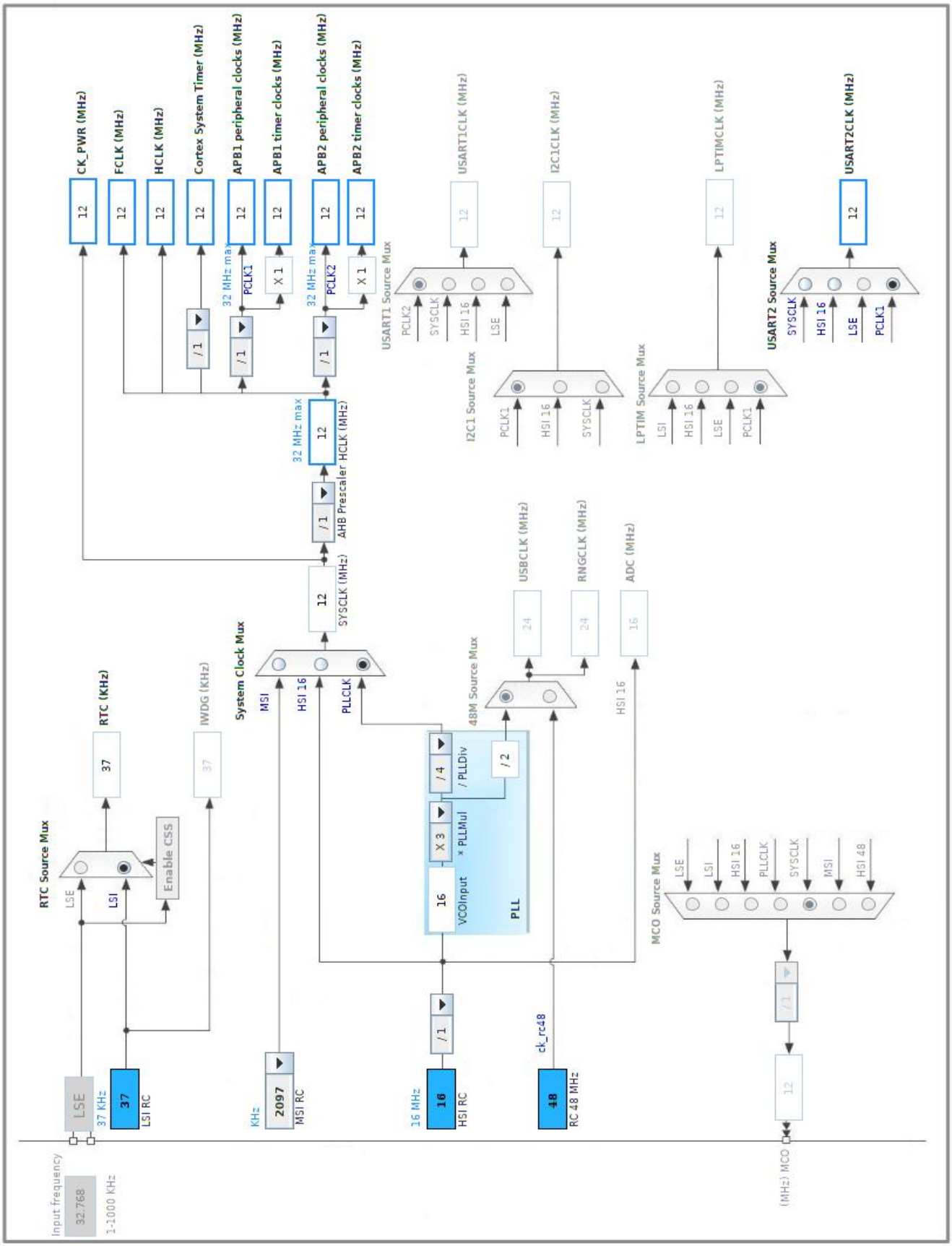


3. Pins Configuration

Pin Number LQFP32	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VDD	Power		
4	NRST	Reset		
5	VDDA	Power		
8	PA2	I/O	USART2_TX	
9	PA3	I/O	USART2_RX	
15	PB1	I/O	GPIO_EXTI1	BTN
16	VSS	Power		
17	VDD	Power		
18	PA8 *	I/O	GPIO_Output	LED
19	PA9	I/O	TSC_G4_IO1	
20	PA10	I/O	TSC_G4_IO2	
23	PA13	I/O	SYS_SWDIO	
24	PA14	I/O	SYS_SWCLK	
29	PB6	I/O	TSC_G5_IO3	
30	PB7	I/O	TSC_G5_IO4	
31	BOOT0	Boot		
32	VSS	Power		

* The pin is affected with an I/O function

4. Clock Tree Configuration



5. IPs and Middleware Configuration

5.1. RTC

mode: Activate Clock Source

mode: Activate Calendar

mode: WakeUp

5.1.1. Parameter Settings:

General:

Hour Format	Hourformat 24
Asynchronous Predivider value	**124 ***
Synchronous Predivider value	**295 ***

Calendar Time:

Data Format	BCD 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	Monday
Month	January
Date	1
Year	0

Wake UP:

Wake Up Clock	**RTCCLK / 4 ***
Wake Up Counter	**2274 ***

5.2. SYS

mode: Debug Serial Wire

Timebase Source: SysTick

5.3. TSC

Sampling: G4_IO1

mode: G4_IO2

Sampling: G5_IO4

mode: G5_IO3

5.3.1. Parameter Settings:

TSC Settings:

Charge Transfer High Pulse Length	2 Cycles
Charge Transfer Low Pulse Length	2 Cycles
Spread Spectrum	Disable
Pulse Generator Prescaler	Synchronous clock mode divided by 4
Maximum Count Value	**16383 charge transfer cycles ***
IO Default Mode	Output push-pull low
Acquisition Mode	Normal acquisition mode
Maximum Count Interrupt	Disable

5.4. USART2

Mode: Asynchronous

5.4.1. 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

*** User modified value**

6. System Configuration

6.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
SYS	PA13	SYS_SWDIO	n/a	n/a	n/a	
	PA14	SYS_SWCLK	n/a	n/a	n/a	
TSC	PA9	TSC_G4_IO1	Alternate Function Open Drain	No pull-up and no pull-down	Low	
	PA10	TSC_G4_IO2	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PB6	TSC_G5_IO3	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PB7	TSC_G5_IO4	Alternate Function Open Drain	No pull-up and no pull-down	Low	
USART2	PA2	USART2_TX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
	PA3	USART2_RX	Alternate Function Push Pull	No pull-up and no pull-down	**Very High ***	
GPIO	PB1	GPIO_EXTI1	**External Interrupt Mode with Falling edge trigger detection**	**Pull-up ***	n/a	BTN
	PA8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED

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
System service call via SWI instruction	true	0	0
Pendable request for system service	true	0	0
System tick timer	true	0	0
RTC global interrupt through EXTI lines 17, 19 and 20 and LSE CSS interrupt through EXTI line 19	true	0	0
EXTI line 0 and line 1 interrupts	true	0	0
Touch sense controller interrupt	true	0	0
USART2 global interrupt / USART2 wake-up interrupt through EXTI line 26	true	0	0
PVD interrupt through EXTI line 16	unused		
Flash and EEPROM global interrupt	unused		
RCC and CRS global interrupt	unused		

*** User modified value**

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32L0
Line	STM32L0x2
MCU	STM32L052K8Tx
Datasheet	025936_Rev7

7.2. Parameter Selection

Temperature	25
Vdd	3.0

7.3. Battery Selection

Battery	Li-MnO2(CR2032)
Capacity	225.0 mAh
Self Discharge	0.12 %/month
Nominal Voltage	3.0 V
Max Cont Current	3.0 mA
Max Pulse Current	15.0 mA
Cells in series	1
Cells in parallel	1

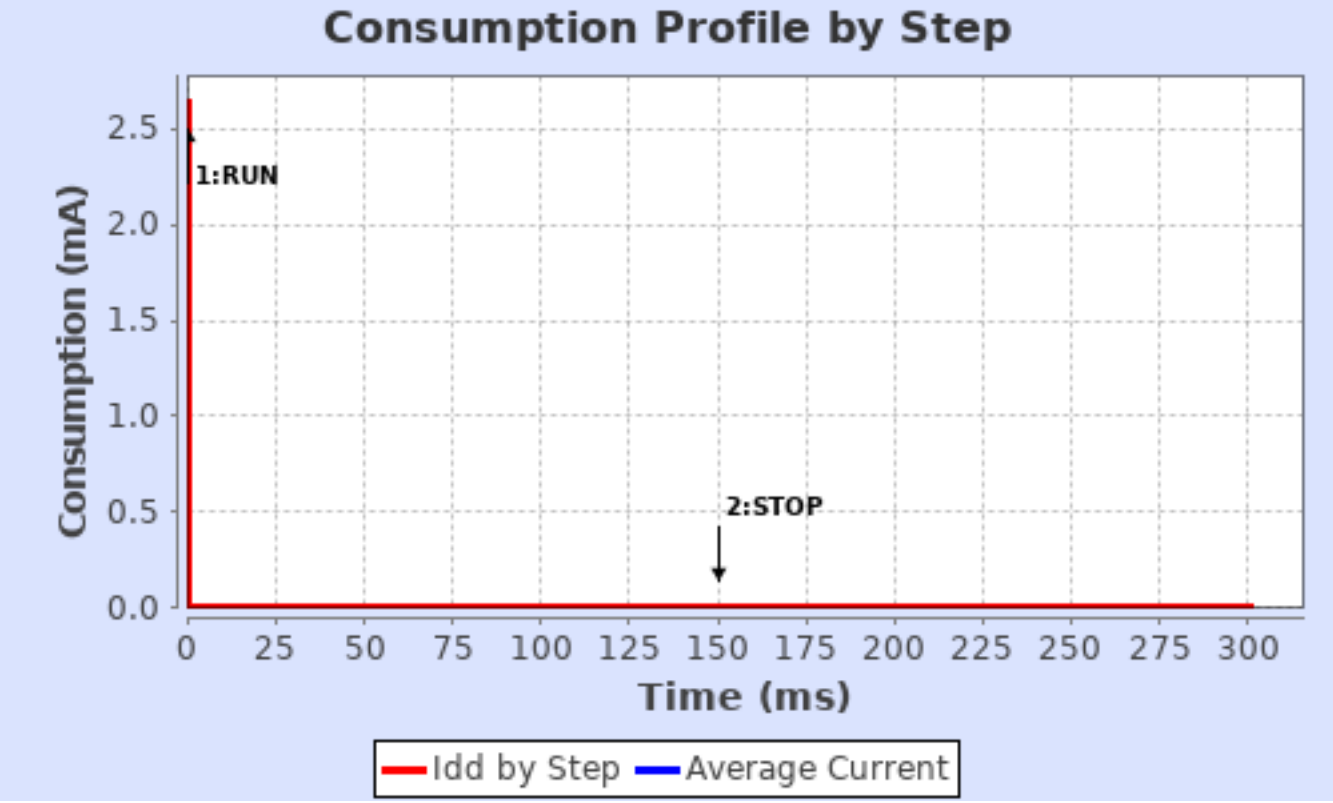
7.4. Sequence

Step	Step1	Step2
Mode	RUN	STOP
Vdd	3.0	3.0
Voltage Source	Battery	Battery
Range	Range2-Medium	NoRange
Fetch Type	FLASH	n/a
Clock Configuration	HSI	ALL CLOCKS OFF
Clock Source Frequency	16 MHz	0 Hz
CPU Frequency	16 MHz	0 Hz
Peripherals	RTC TSC	RTC
Additional Cons.	0 mA	0 mA
Average Current	2.64 mA	890 nA
Duration	300 µs	300 ms
DMIPS	15.2	0.0
Ta Max	104.55	105
Category	In DS Table	In DS Table

7.5. RESULTS

Sequence Time	300 ms	Average Current	3.53 µA
Battery Life	6 years, 7 months, 2 days, 22 hours	Average DMIPS	15.2 DMIPS

7.6. Chart


Consumption Profile by Step
Consumption (mA)
2.5
2.0
1.5
1.0
0.5
0.0
1:RUN
2:STOP
0
25
50
75
100
125
150
175
200
225
250
275
300
Time (ms)
Idd by Step
Average Current

8. Software Project

8.1. Project Settings

Name	Value
Project Name	stm32tsc
Project Folder	/home/sungjune/Projects/public/stm32tsc
Toolchain / IDE	Makefile
Firmware Package Name and Version	STM32Cube FW_L0 V1.10.0

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)	No

9. Software Pack Report