

1. Description

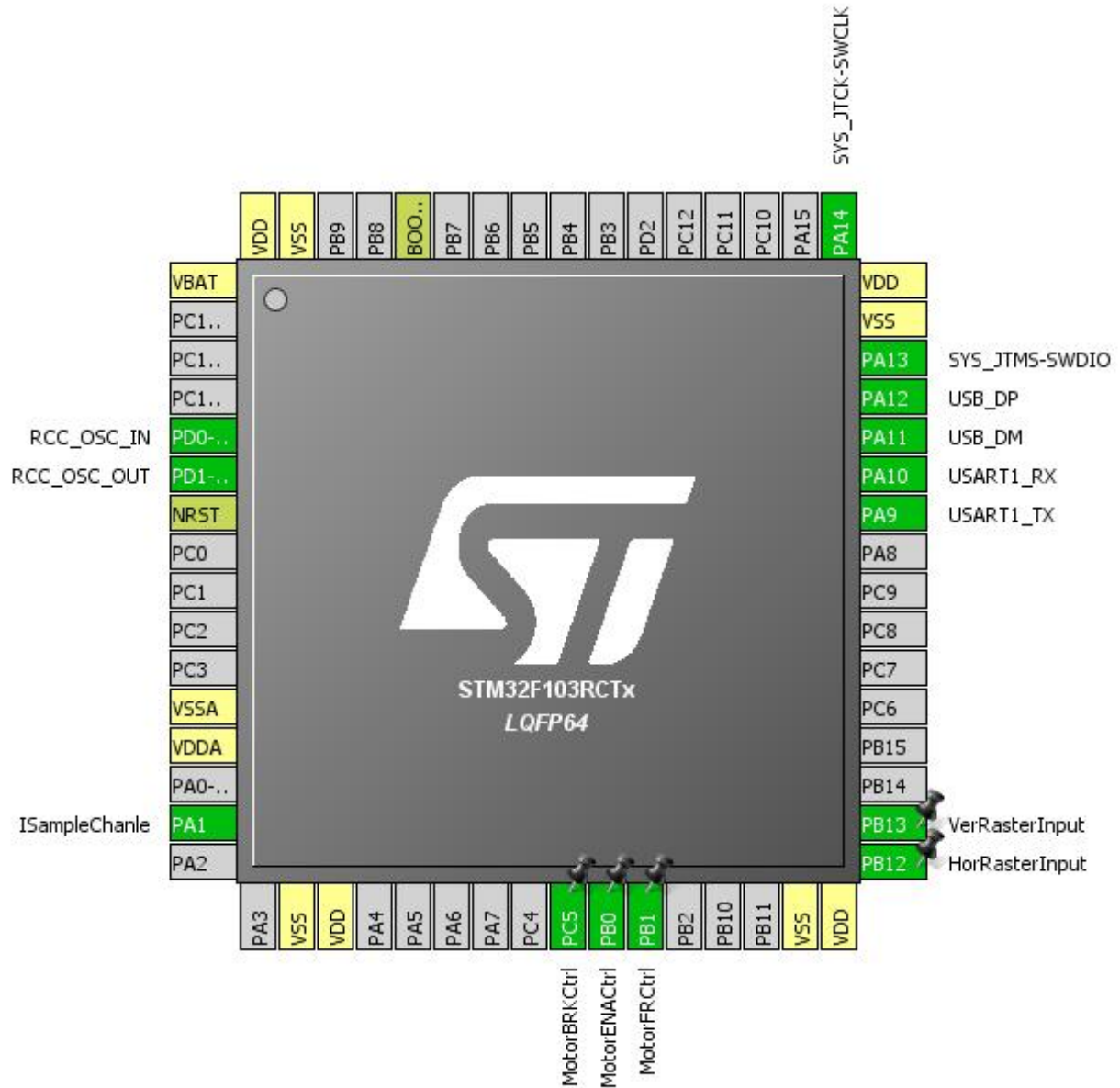
1.1. Project

Project Name	MCWFv1
Board Name	MCWFv1.0
Generated with:	STM32CubeMX 4.23.0
Date	12/04/2017

1.2. MCU

MCU Series	STM32F1
MCU Line	STM32F103
MCU name	STM32F103RCTx
MCU Package	LQFP64
MCU Pin number	64

2. Pinout Configuration

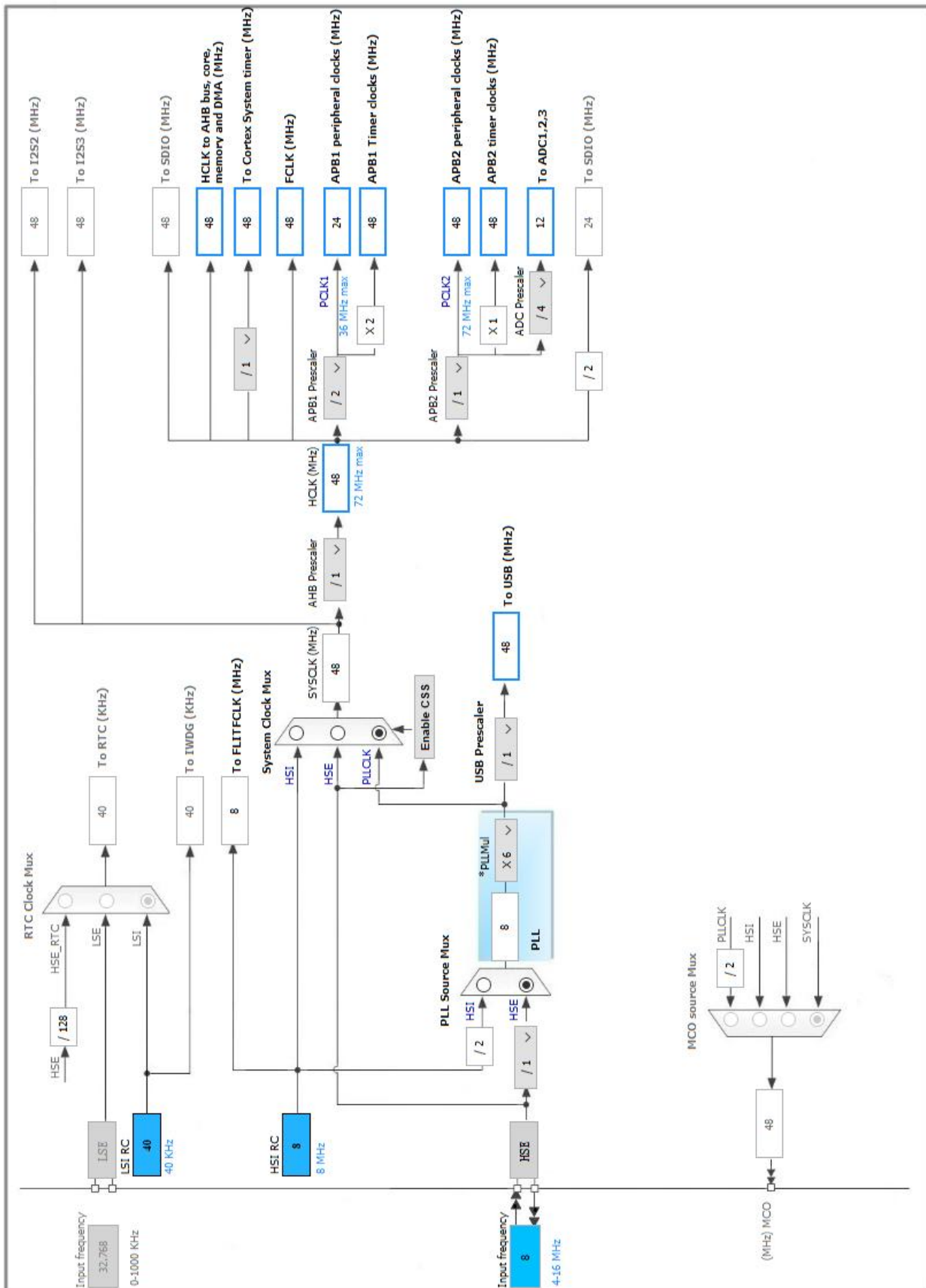


3. Pins Configuration

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
5	PD0-OSC_IN	I/O	RCC_OSC_IN	
6	PD1-OSC_OUT	I/O	RCC_OSC_OUT	
7	NRST	Reset		
12	VSSA	Power		
13	VDDA	Power		
15	PA1	I/O	ADC1_IN1	ISampleChanle
18	VSS	Power		
19	VDD	Power		
25	PC5 *	I/O	GPIO_Output	MotorBRKCtrl
26	PB0 *	I/O	GPIO_Output	MotorENACtrl
27	PB1 *	I/O	GPIO_Output	MotorFRCtrl
31	VSS	Power		
32	VDD	Power		
33	PB12 *	I/O	GPIO_Input	HorRasterInput
34	PB13 *	I/O	GPIO_Input	VerRasterInput
42	PA9	I/O	USART1_TX	
43	PA10	I/O	USART1_RX	
44	PA11	I/O	USB_DM	
45	PA12	I/O	USB_DP	
46	PA13	I/O	SYS_JTMS-SWDIO	
47	VSS	Power		
48	VDD	Power		
49	PA14	I/O	SYS_JTCK-SWCLK	
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. ADC1

mode: IN1

mode: Temperature Sensor Channel

5.1.1. Parameter Settings:

ADCs_Common_Settings:

Mode Independent mode

ADC_Settings:

Data Alignment Right alignment

Scan Conversion Mode Enabled

Continuous Conversion Mode **Enabled ***

Discontinuous Conversion Mode Disabled

ADC_Regular_ConversionMode:

Enable Regular Conversions Enable

Number Of Conversion **2 ***

External Trigger Conversion Source Regular Conversion launched by software

Rank 1

Channel Channel 1

Sampling Time **28.5 Cycles ***

Rank **2 ***

Channel **Channel Temperature Sensor ***

Sampling Time **28.5 Cycles ***

ADC_Injected_ConversionMode:

Number Of Conversions 0

WatchDog:

Enable Analog WatchDog Mode false

5.2. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

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 Timeout Value (ms)	100
LSE Startup Timeout Value (ms)	5000

5.3. SYS

Debug: Serial Wire

Timebase Source: SysTick

5.4. TIM4

mode: Clock Source

5.4.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	48-1 *
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	2000-1 *
Internal Clock Division (CKD)	No Division
auto-reload preload	Enable *

Trigger Output (TRGO) Parameters:

Master/Slave Mode	Disable (no sync between this TIM (Master) and its Slaves)
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

5.5. TIM5

mode: Clock Source

5.5.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	48-1 *
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	1000-1 *
Internal Clock Division (CKD)	No Division
auto-reload preload	Enable *

Trigger Output (TRGO) Parameters:

Master/Slave Mode	Disable (no sync between this TIM (Master) and its Slaves
Trigger Event Selection	Reset (UG bit from TIMx_EGR)

5.6. USART1

Mode: Asynchronous

5.6.1. 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

5.7. USB

mode: Device (FS)

5.7.1. Parameter Settings:

Basic Parameters:

Speed	Full Speed 12MBit/s
Endpoint 0 Max Packet size	8 Bytes

Power Parameters:

Low Power	Disabled
Link Power Management	Disabled
Battery Charging	Disabled

5.8. USB_DEVICE

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

5.8.1. 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	2048
USB CDC Tx Buffer Size	2048

5.8.2. 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
ADC1	PA1	ADC1_IN1	Analog mode	n/a	n/a	ISampleChanle
RCC	PD0-OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	
	PD1-OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
USART1	PA9	USART1_TX	Alternate Function Push Pull	n/a	High *	
	PA10	USART1_RX	Input mode	No pull-up and no pull-down	n/a	
USB	PA11	USB_DM	n/a	n/a	n/a	
	PA12	USB_DP	n/a	n/a	n/a	
GPIO	PC5	GPIO_Output	Output Push Pull	n/a	Low	MotorBRKCtrl
	PB0	GPIO_Output	Output Push Pull	n/a	Low	MotorENACtrl
	PB1	GPIO_Output	Output Push Pull	n/a	Low	MotorFRCtrl
	PB12	GPIO_Input	Input mode	Pull-down *	n/a	HorRasterInput
	PB13	GPIO_Input	Input mode	Pull-down *	n/a	VerRasterInput

6.2. DMA configuration

DMA request	Stream	Direction	Priority
ADC1	DMA1_Channel1	Peripheral To Memory	Low
USART1_RX	DMA1_Channel5	Peripheral To Memory	Low
USART1_TX	DMA1_Channel4	Memory To Peripheral	Low

ADC1: DMA1_Channel1 DMA request Settings:

Mode: **Circular ***
 Peripheral Increment: Disable
 Memory Increment: **Enable ***
 Peripheral Data Width: **Word ***
 Memory Data Width: **Word ***

USART1_RX: DMA1_Channel5 DMA request Settings:

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

USART1_TX: DMA1_Channel4 DMA request Settings:

Mode: **Circular ***
 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	0	0
System tick timer	true	0	0
DMA1 channel1 global interrupt	true	0	0
DMA1 channel4 global interrupt	true	0	0
DMA1 channel5 global interrupt	true	0	0
ADC1 and ADC2 global interrupts	true	0	0
USB low priority or CAN RX0 interrupts	true	0	0
TIM4 global interrupt	true	0	0
USART1 global interrupt	true	0	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
USB high priority or CAN TX interrupts	unused		
TIM5 global interrupt	unused		

* User modified value

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32F1
Line	STM32F103
MCU	STM32F103RCTx
Datasheet	14611_Rev12

7.2. Parameter Selection

Temperature	25
Vdd	3.3

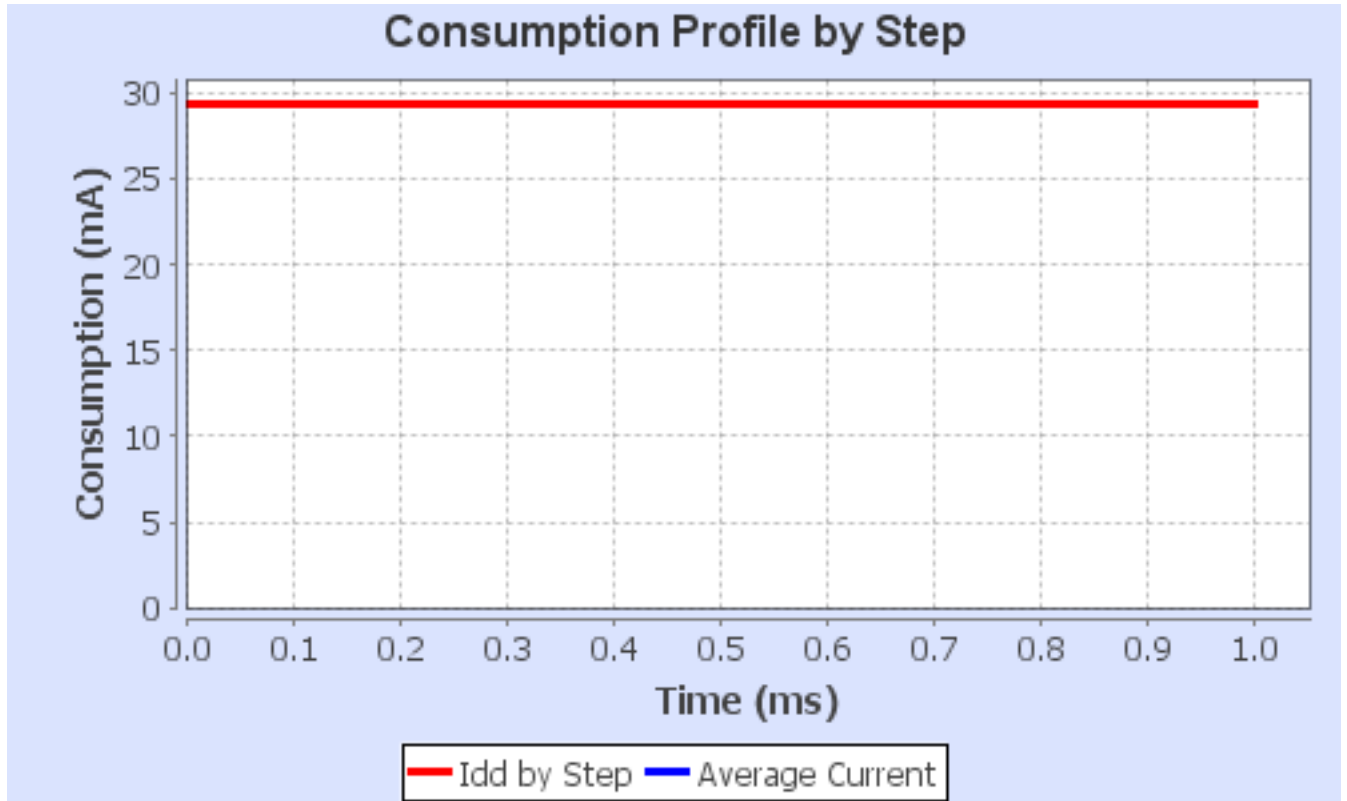
7.3. Sequence

Step	Step1
Mode	RUN
Vdd	3.3
Voltage Source	Battery
Range	No Scale
Fetch Type	FLASH
Clock Configuration	HSE PLL
Clock Source Frequency	8 MHz
CPU Frequency	48 MHz
Peripherals	ADC1 APB1-Bridge APB2-Bridge DAC:OUT1 DMA1 I2C1 TIM4 TIM5 USART1 USB
Additional Cons.	0 mA
Average Current	29.35 mA
Duration	1 ms
DMIPS	0.0
Ta Max	100.64
Category	In DS Table

7.4. RESULTS

Sequence Time	1 ms	Average Current	29.35 mA
Battery Life	0	Average DMIPS	60.0 DMIPS

7.5. Chart



8. Software Project

8.1. Project Settings

Name	Value
Project Name	MCWFv1.0
Project Folder	E:\Users\17657\Documents\GitHub\MotorControlWithFilter\MCWFv1.0
Toolchain / IDE	EWARM
Firmware Package Name and Version	STM32Cube FW_F1 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