



## 1. Description

### 1.1. Project

Project Name	FreeRTOS_ThreadCreation
Board Name	custom
Generated with:	STM32CubeMX 6.3.0
Date	10/09/2021

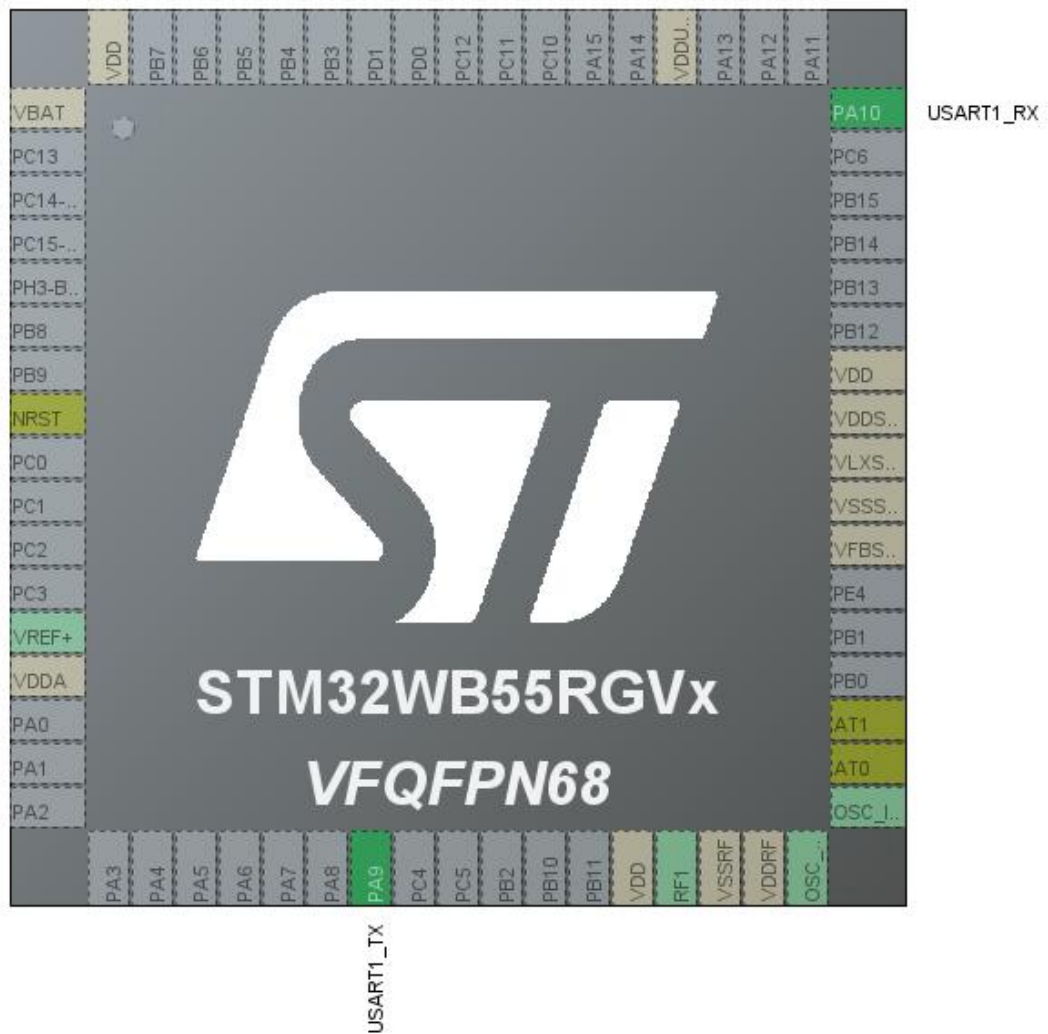
### 1.2. MCU

MCU Series	STM32WB
MCU Line	STM32WBx5
MCU name	STM32WB55RGVx
MCU Package	VFQFPN68
MCU Pin number	68

### 1.3. Core(s) information

Core(s)	ARM Cortex-M4
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## 2. Pinout Configuration



### 3. Pins Configuration

Pin Number VFQFPN68	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
8	NRST	Reset		
14	VDDA	Power		
24	PA9	I/O	USART1_TX	
30	VDD	Power		
32	VSSRF	Power		
33	VDDRF	Power		
36	AT0	NC		
37	AT1	NC		
41	VFBSMPS	Power		
42	VSSSMPS	Power		
43	VLXSMPS	Power		
44	VDDSMPS	Power		
45	VDD	Power		
51	PA10	I/O	USART1_RX	
55	VDDUSB	Power		
68	VDD	Power		



## 5. Software Project

### 5.1. Project Settings

Name	Value
Project Name	FreeRTOS_ThreadCreation
Project Folder	C:\Users\bykowmar\Downloads\PASA\BLE_module\STmicro\stmicro_eval\STM3
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_WB V1.12.1
Application Structure	Basic
Generate Under Root	No
Do not generate the main()	No
Minimum Heap Size	0x200
Minimum Stack Size	0x400

### 5.2. Code Generation Settings

Name	Value
STM32Cube MCU packages and embedded software	Add necessary library files as reference in the toolchain project configuration file
Generate peripheral initialization as a pair of '.c/.h' files	No
Backup previously generated files when re-generating	No
Keep User Code when re-generating	Yes
Delete previously generated files when not re-generated	Yes
Set all free pins as analog (to optimize the power consumption)	No
Enable Full Assert	No

### 5.3. Advanced Settings - Generated Function Calls

Rank	Function Name	Peripheral Instance Name
1	SystemClock_Config	RCC
2	MX_GPIO_Init	GPIO
3	MX_USART1_UART_Init	USART1

## 6. Power Consumption Calculator report

### 6.1. Microcontroller Selection

Series	STM32WB
Line	STM32WBx5
MCU	STM32WB55RGVx
Datasheet	DS11929_Rev3

### 6.2. Parameter Selection

Temperature	25
Vdd	3.0

### 6.3. Battery Selection

Battery	Li-SOCL2(A3400)
Capacity	3400.0 mAh
Self Discharge	0.08 %/month
Nominal Voltage	3.6 V
Max Cont Current	100.0 mA
Max Pulse Current	200.0 mA
Cells in series	1
Cells in parallel	1

#### 6.4. Sequence

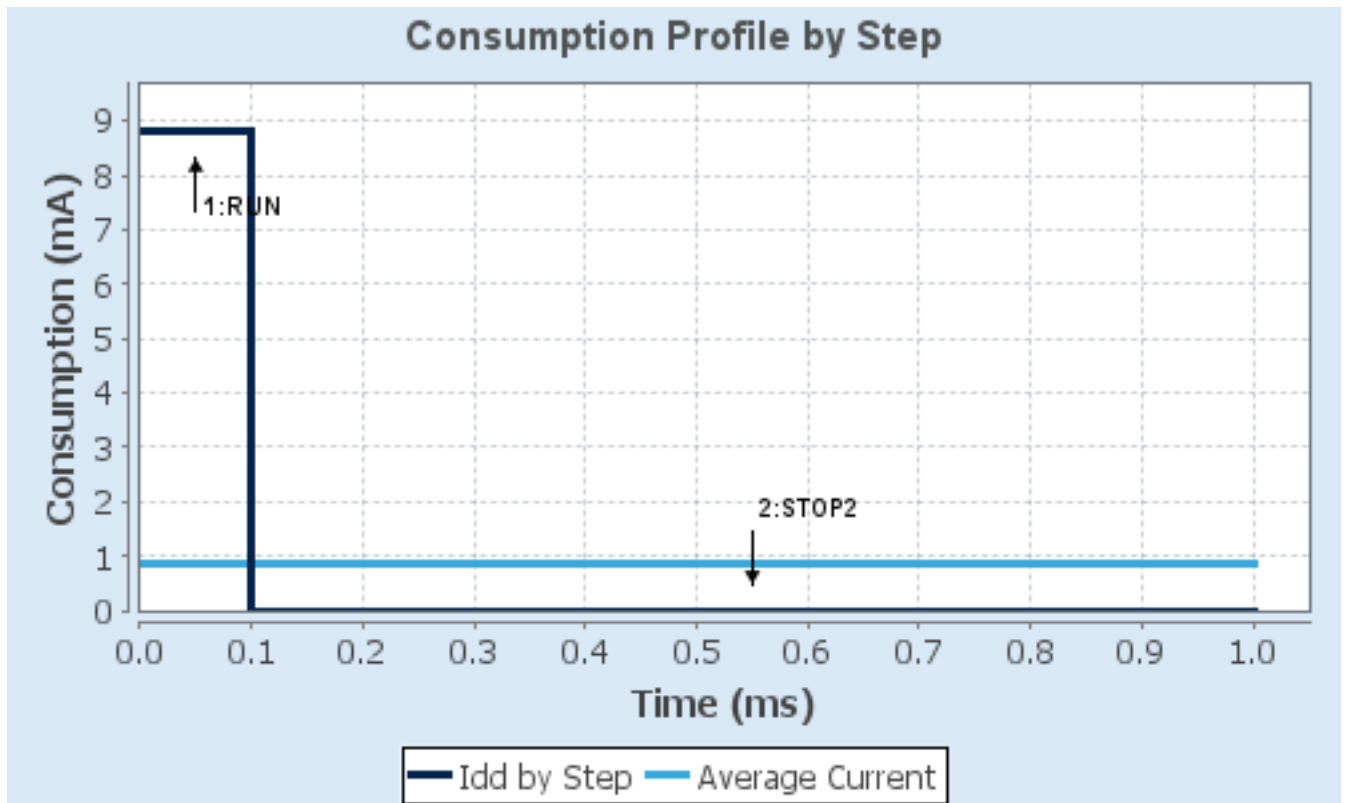
<b>Step</b>	Step1	Step2
<b>Mode</b>	RUN	STOP2
<b>Vdd</b>	3.0	3.0
<b>Voltage Source</b>	Battery	Battery
<b>Range</b>	Range1-High	NoRange
<b>Fetch Type</b>	SRAM1/Flash-PowerDown	FLASH/ART/CACHE
<b>CPU Frequency</b>	64 MHz	0 Hz
<b>Clock Configuration</b>	HSI PLL Regulator_ON	ALL CLOCKS OFF Regulator_ON
<b>Clock Source Frequency</b>	16 MHz	0 Hz
<b>Peripherals</b>		
<b>Additional Cons.</b>	0 mA	0 mA
<b>Average Current</b>	8.8 mA	1.85 $\mu$ A
<b>Duration</b>	0.1 ms	0.9 ms
<b>DMIPS</b>	80.0	0.0
<b>Ta Max</b>	103.76	105
<b>Category</b>	In DS Table	In DS Table

#### 6.5. Results

Sequence Time	1 ms	Average Current	881.66 $\mu$ A
Battery Life	5 months, 7 days, 21 hours	Average DMIPS	8.0 DMIPS

#### 6.6. Chart





## 7. Peripherals and Middlewares Configuration

### 7.1. RCC

#### 7.1.1. Parameter Settings:

##### System Parameters:

VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Disabled
Data Cache	Enabled
Flash Latency(WS)	3 WS (4 CPU cycle)

##### RCC Parameters:

HSI Calibration Value	16
MSI Calibration Value	0
MSI Auto Calibration	Disabled
MSI State	Enabled
HSI State	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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##### Peripherals Clock Configuration:

Generate the peripherals clock configuration	<b>FALSE *</b>
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### 7.2. SYS

**Timebase Source: TIM1**

### 7.3. USART1

**Mode: Asynchronous**

#### 7.3.1. 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
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Over Sampling	16 Samples
Single Sample	Disable
ClockPrescaler	1
Fifo Mode	Disable
Txfifo Threshold	1 eighth full configuration
Rxfifo Threshold	1 eighth full configuration

**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

## 7.4. FREERTOS

### Interface: CMSIS\_V1

#### 7.4.1. Config parameters:

**API:**

FreeRTOS API	CMSIS v1
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**Versions:**

FreeRTOS version	10.3.1
CMSIS-RTOS version	1.02

**MPU/FPU:**

ENABLE_MPU	Disabled
ENABLE_FPU	Disabled

**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
ENABLE_BACKWARD_COMPATIBILITY	Enabled
USE_PORT_OPTIMISED_TASK_SELECTION	Enabled
USE_TICKLESS_IDLE	Disabled
USE_TASK_NOTIFICATIONS	Enabled
RECORD_STACK_HIGH_ADDRESS	Disabled
OVERRIDE_DEFAULT_TICK_CONFIGURATION	Disabled

#### Memory management settings:

Memory Allocation	Dynamic
TOTAL_HEAP_SIZE	3072
Memory Management scheme	heap_4

#### Hook function related definitions:

USE_IDLE_HOOK	Disabled
USE_TICK_HOOK	Disabled
USE_MALLOC_FAILED_HOOK	Disabled
USE_DAEMON_TASK_STARTUP_HOOK	Disabled
CHECK_FOR_STACK_OVERFLOW	Disabled

#### Run time and task stats gathering related definitions:

GENERATE_RUN_TIME_STATS	Disabled
USE_TRACE_FACILITY	Disabled
USE_STATS_FORMATTING_FUNCTIONS	Disabled

#### Co-routine related definitions:

USE_CO_ROUTINES	Disabled
MAX_CO_ROUTINE_PRIORITIES	2

#### Software timer definitions:

USE_TIMERS	Disabled
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#### Interrupt nesting behaviour configuration:

LIBRARY_LOWEST_INTERRUPT_PRIORITY	15
LIBRARY_MAX_SYSCALL_INTERRUPT_PRIORITY	5

#### Added with 10.2.1 support:

MESSAGE_BUFFER_LENGTH_TYPE	size_t
USE_POSIX_ERRNO	Disabled

### 7.4.2. 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
xTaskAbortDelay	Disabled
xTaskGetHandle	Disabled
uxTaskGetStackHighWaterMark2	Disabled

#### 7.4.3. Advanced settings:

##### **Newlib settings (see parameter description first):**

USE\_NEWLIB\_REENTRANT                      Disabled

##### **Project settings (see parameter description first):**

Use FW pack heap file                      Enabled

**\* User modified value**

## 8. System Configuration

### 8.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
USART1	PA9	USART1_TX	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA10	USART1_RX	Alternate Function Push Pull	No pull-up and no pull-down	Low	

### 8.2. DMA configuration

nothing configured in DMA service

### 8.3. NVIC configuration

#### 8.3.1. NVIC

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
TIM1 update interrupt and TIM16 global interrupt	true	15	0
USART1 global interrupt	true	5	0
PVD/PVM0/PVM2 interrupts through EXTI lines 16/31/33	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
CPU2 SEV interrupt through EXTI line 40 and PWR CPU2 HOLD wake-up interrupt	unused		
PWR switching on the fly, end of BLE activity, end of 802.15.4 activity, end of critical radio phase interrupt	unused		
FPU global interrupt	unused		

#### 8.3.2. NVIC Code generation

Enabled interrupt Table	Select for init sequence ordering	Generate IRQ handler	Call HAL handler
Non maskable interrupt	false	true	false
Hard fault interrupt	false	true	false
Memory management fault	false	true	false
Prefetch fault, memory access fault	false	true	false
Undefined instruction or illegal state	false	true	false
System service call via SWI instruction	false	false	false
Debug monitor	false	true	false
Pendable request for system service	false	false	false
System tick timer	false	false	true
TIM1 update interrupt and TIM16 global interrupt	false	true	true
USART1 global interrupt	false	true	true

\* User modified value



## 9. System Views

### 9.1. Category view

#### 9.1.1. Current

##### Middleware

FreeRTOS 

##### System Core

##### Analog

##### Timers

##### Connectivity

##### Multimedia

##### Security

##### Computing

##### Utilities

DMA

USART1 

GPIO 

I2C 

RCC 

SYS 

## 10. Docs & Resources

Type	Link
Datasheet	<a href="http://www.st.com/resource/en/datasheet/DM00344191.pdf">http://www.st.com/resource/en/datasheet/DM00344191.pdf</a>
Reference manual	<a href="http://www.st.com/resource/en/reference_manual/DM00318631.pdf">http://www.st.com/resource/en/reference_manual/DM00318631.pdf</a>
Programming manual	<a href="http://www.st.com/resource/en/programming_manual/DM00046982.pdf">http://www.st.com/resource/en/programming_manual/DM00046982.pdf</a>
Programming manual	<a href="http://www.st.com/resource/en/programming_manual/DM00104451.pdf">http://www.st.com/resource/en/programming_manual/DM00104451.pdf</a>
Programming manual	<a href="http://www.st.com/resource/en/programming_manual/DM00716581.pdf">http://www.st.com/resource/en/programming_manual/DM00716581.pdf</a>
Errata sheet	<a href="http://www.st.com/resource/en/errata_sheet/DM00383256.pdf">http://www.st.com/resource/en/errata_sheet/DM00383256.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/CD00167594.pdf">http://www.st.com/resource/en/application_note/CD00167594.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/CD00211314.pdf">http://www.st.com/resource/en/application_note/CD00211314.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/CD00259245.pdf">http://www.st.com/resource/en/application_note/CD00259245.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/CD00264342.pdf">http://www.st.com/resource/en/application_note/CD00264342.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/CD00264379.pdf">http://www.st.com/resource/en/application_note/CD00264379.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00042534.pdf">http://www.st.com/resource/en/application_note/DM00042534.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00072315.pdf">http://www.st.com/resource/en/application_note/DM00072315.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00073742.pdf">http://www.st.com/resource/en/application_note/DM00073742.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00081379.pdf">http://www.st.com/resource/en/application_note/DM00081379.pdf</a>
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Application note	<a href="http://www.st.com/resource/en/application_note/DM00087593.pdf">http://www.st.com/resource/en/application_note/DM00087593.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00151811.pdf">http://www.st.com/resource/en/application_note/DM00151811.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00160482.pdf">http://www.st.com/resource/en/application_note/DM00160482.pdf</a>
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Application note	<a href="http://www.st.com/resource/en/application_note/DM00226326.pdf">http://www.st.com/resource/en/application_note/DM00226326.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00227538.pdf">http://www.st.com/resource/en/application_note/DM00227538.pdf</a>
Application note	<a href="http://www.st.com/resource/en/application_note/DM00236305.pdf">http://www.st.com/resource/en/application_note/DM00236305.pdf</a>
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