

1. Description

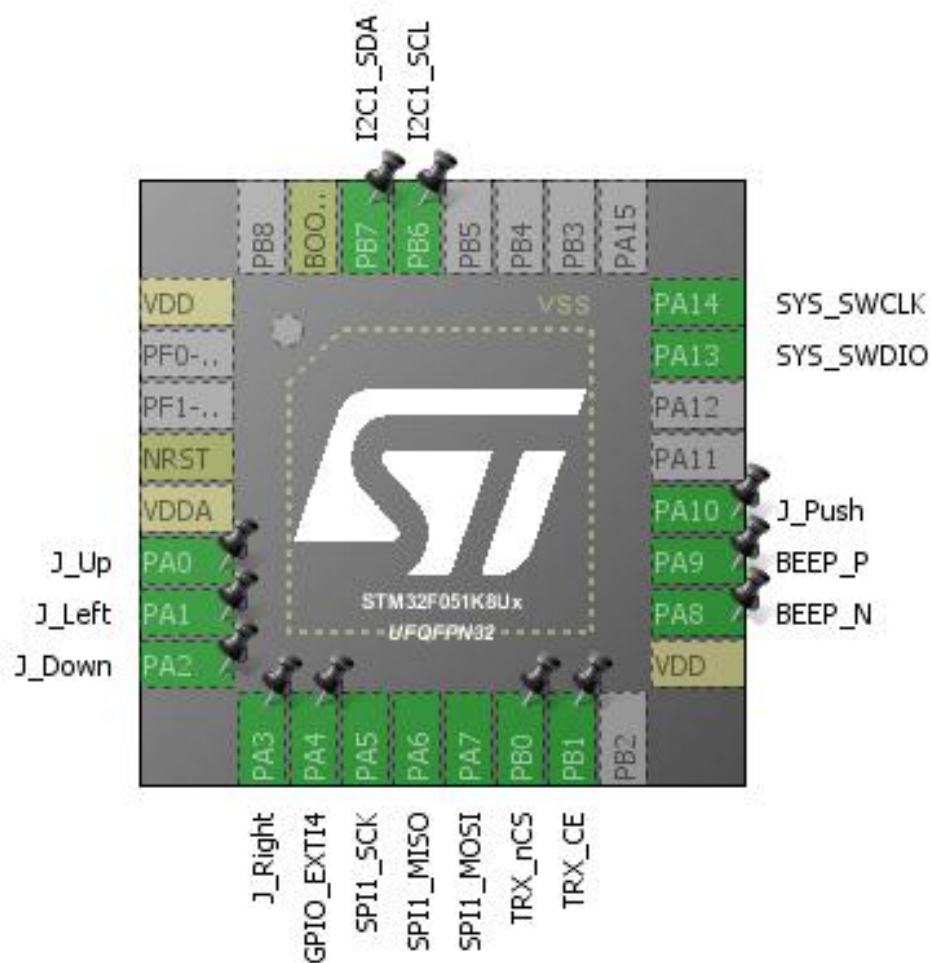
1.1. Project

| | |
|-----------------|--------------------|
| Project Name | Keyfob |
| Board Name | Keyfob |
| Generated with: | STM32CubeMX 4.22.1 |
| Date | 11/27/2017 |

1.2. MCU

| | |
|----------------|---------------|
| MCU Series | STM32F0 |
| MCU Line | STM32F0x1 |
| MCU name | STM32F051K8Ux |
| MCU Package | UFQFPN32 |
| MCU Pin number | 32 |

2. Pinout Configuration

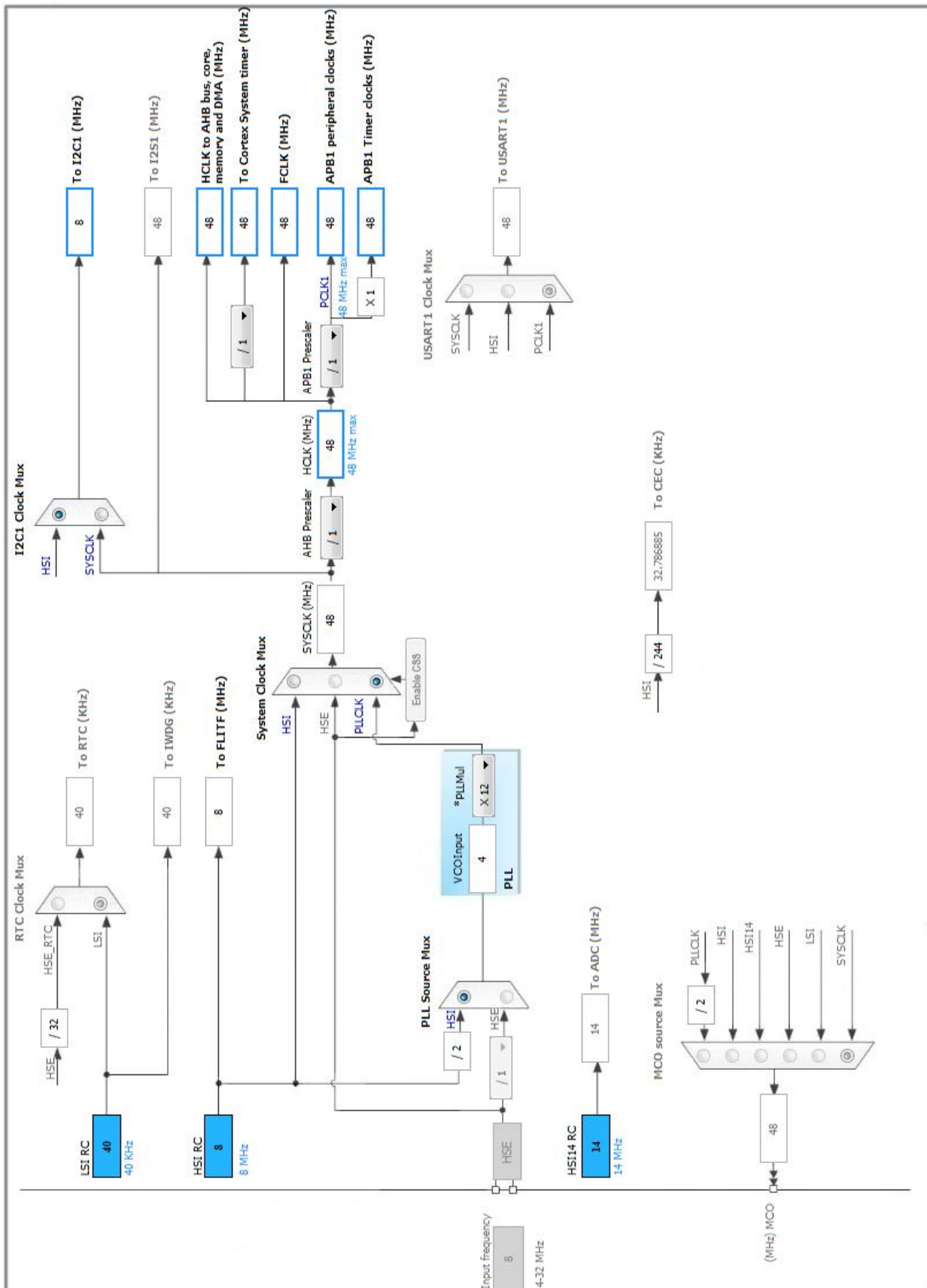


3. Pins Configuration

| Pin Number UFQFPN32 | Pin Name (function after reset) | Pin Type | Alternate Function(s) | Label |
|------------------------|---------------------------------------|----------|--------------------------|---------|
| 1 | VDD | Power | | |
| 4 | NRST | Reset | | |
| 5 | VDDA | Power | | |
| 6 | PA0 * | I/O | GPIO_Input | J_Up |
| 7 | PA1 * | I/O | GPIO_Input | J_Left |
| 8 | PA2 * | I/O | GPIO_Input | J_Down |
| 9 | PA3 * | I/O | GPIO_Input | J_Right |
| 10 | PA4 | I/O | GPIO_EXTI4 | |
| 11 | PA5 | I/O | SPI1_SCK | |
| 12 | PA6 | I/O | SPI1_MISO | |
| 13 | PA7 | I/O | SPI1_MOSI | |
| 14 | PB0 * | I/O | GPIO_Output | TRX_nCS |
| 15 | PB1 * | I/O | GPIO_Output | TRX_CE |
| 17 | VDD | Power | | |
| 18 | PA8 * | I/O | GPIO_Output | BEEP_N |
| 19 | PA9 * | I/O | GPIO_Output | BEEP_P |
| 20 | PA10 * | I/O | GPIO_Input | J_Push |
| 23 | PA13 | I/O | SYS_SWDIO | |
| 24 | PA14 | I/O | SYS_SWCLK | |
| 29 | PB6 | I/O | I2C1_SCL | |
| 30 | PB7 | I/O | I2C1_SDA | |
| 31 | BOOT0 | Boot | | |

* 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 | Standard Mode |
| I2C Speed Frequency (KHz) | 100 |
| Rise Time (ns) | 0 |
| Fall Time (ns) | 0 |
| Coefficient of Digital Filter | 0 |
| Analog Filter | Enabled |
| Timing | 0x2000090E |

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. SPI1

Mode: Full-Duplex Master

5.2.1. Parameter Settings:

Basic Parameters:

| | |
|--------------|-----------------|
| Frame Format | Motorola |
| Data Size | 8 Bits * |
| First Bit | MSB First |

Clock Parameters:

| | |
|---------------------------|-----------------------|
| Prescaler (for Baud Rate) | 4 * |
| Baud Rate | 12.0 MBits/s * |
| Clock Polarity (CPOL) | High * |
| Clock Phase (CPHA) | 1 Edge |

Advanced Parameters:

| | |
|-----------------|----------|
| CRC Calculation | Disabled |
| NSSP Mode | Enabled |
| NSS Signal Type | Software |

5.3. SYS

mode: Debug Serial Wire

Timebase Source: SysTick

5.4. FREERTOS

mode: Enabled

5.4.1. Config parameters:

Versions:

| | |
|--------------------|-------|
| FreeRTOS version | 9.0.0 |
| CMSIS-RTOS version | 1.02 |

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 | Disabled |
| USE_TICKLESS_IDLE | Disabled |
| USE_TASK_NOTIFICATIONS | Enabled |

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 |
|------------|----------|

Interrupt nesting behaviour configuration:

| | |
|--|---|
| LIBRARY_LOWEST_INTERRUPT_PRIORITY | 3 |
| LIBRARY_MAX_SYSCALL_INTERRUPT_PRIORITY | 3 |

5.4.2. 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 |

* 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 | High * | |
| | PB7 | I2C1_SDA | Alternate Function Open Drain | Pull-up | High * | |
| SPI1 | PA5 | SPI1_SCK | Alternate Function Push Pull | No pull-up and no pull-down | High * | |
| | PA6 | SPI1_MISO | Alternate Function Push Pull | No pull-up and no pull-down | High * | |
| | PA7 | SPI1_MOSI | Alternate Function Push Pull | No pull-up and no pull-down | High * | |
| SYS | PA13 | SYS_SWDIO | n/a | n/a | n/a | |
| | PA14 | SYS_SWCLK | n/a | n/a | n/a | |
| GPIO | PA0 | GPIO_Input | Input mode | No pull-up and no pull-down | n/a | J_Up |
| | PA1 | GPIO_Input | Input mode | No pull-up and no pull-down | n/a | J_Left |
| | PA2 | GPIO_Input | Input mode | No pull-up and no pull-down | n/a | J_Down |
| | PA3 | GPIO_Input | Input mode | No pull-up and no pull-down | n/a | J_Right |
| | PA4 | GPIO_EXTI4 | External Interrupt Mode with Rising 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 | Low | TRX_nCS |
| | PB1 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | TRX_CE |
| | PA8 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | BEEP_N |
| | PA9 | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | BEEP_P |
| | PA10 | GPIO_Input | Input mode | No pull-up and no pull-down | n/a | J_Push |

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 | 3 | 0 |
| System tick timer | true | 3 | 0 |
| EXTI line 4 to 15 interrupts | true | 3 | 0 |
| PVD interrupt through EXTI Line16 | unused | | |
| Flash global interrupt | unused | | |
| RCC global interrupt | unused | | |
| I2C1 event global interrupt / I2C1 wake-up interrupt through EXTI line 23 | unused | | |
| SPI1 global interrupt | unused | | |

* User modified value

7. Power Consumption Calculator report

7.1. Microcontroller Selection

| | |
|-----------|---------------|
| Series | STM32F0 |
| Line | STM32F0x1 |
| MCU | STM32F051K8Ux |
| Datasheet | 022265_Rev7 |

7.2. Parameter Selection

| | |
|-------------|-----|
| Temperature | 25 |
| Vdd | 3.3 |

8. Software Project

8.1. Project Settings

| Name | Value |
|-----------------------------------|-----------------------------------|
| Project Name | Keyfob |
| Project Folder | D:\Work\Alarm\F0B\SW\F0B_3\Keyfob |
| Toolchain / IDE | EWARM |
| Firmware Package Name and Version | STM32Cube FW_F0 V1.9.0 |

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 | 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 |