1. Description

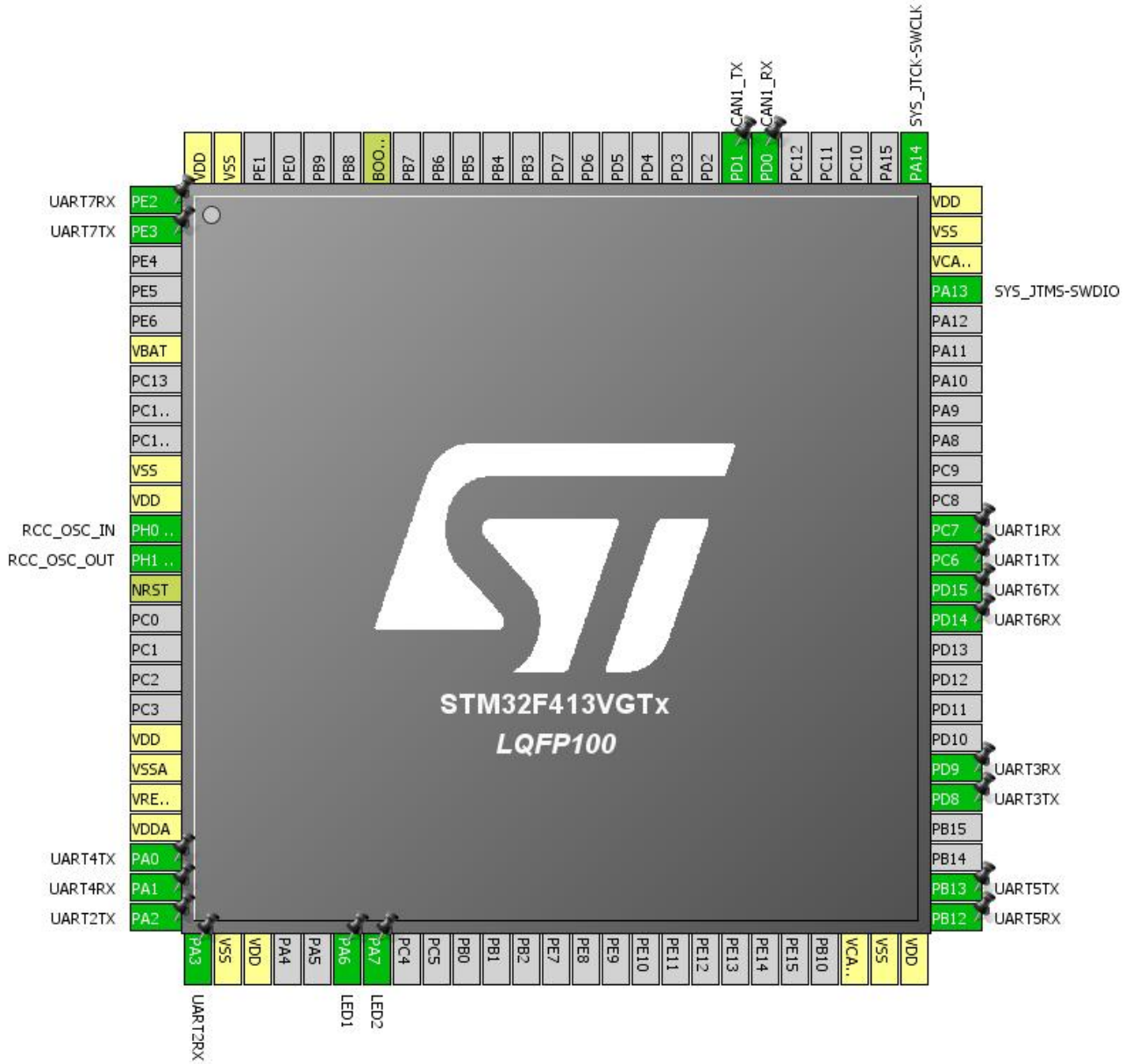
1.1. Project

Project Name	SingleBoard
Board Name	SingleBoard
Generated with:	STM32CubeMX 4.19.0
Date	10/24/2017

1.2. MCU

MCU Series	STM32F4
MCU Line	STM32F413/423
MCU name	STM32F413VGTx
MCU Package	LQFP100
MCU Pin number	100

2. Pinout Configuration



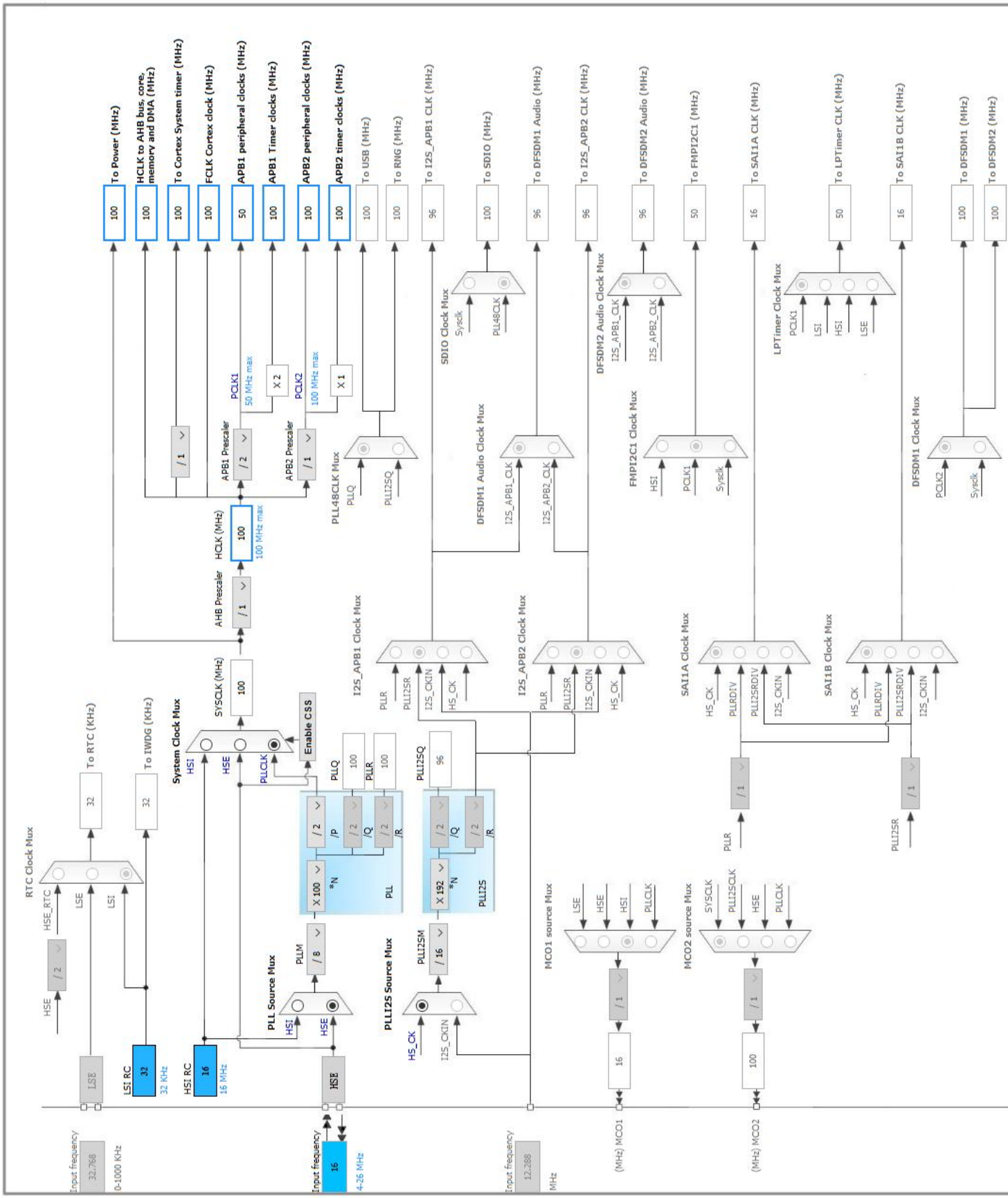
3. Pins Configuration

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	PE2 *	I/O	GPIO_Input	UART7RX
2	PE3 *	I/O	GPIO_Input	UART7TX
6	VBAT	Power		
10	VSS	Power		
11	VDD	Power		
12	PH0 - OSC_IN	I/O	RCC_OSC_IN	
13	PH1 - OSC_OUT	I/O	RCC_OSC_OUT	
14	NRST	Reset		
19	VDD	Power		
20	VSSA	Power		
21	VREF+	Power		
22	VDDA	Power		
23	PA0 *	I/O	GPIO_Input	UART4TX
24	PA1 *	I/O	GPIO_Input	UART4RX
25	PA2 *	I/O	GPIO_Input	UART2TX
26	PA3 *	I/O	GPIO_Input	UART2RX
27	VSS	Power		
28	VDD	Power		
31	PA6 *	I/O	GPIO_Output	LED1
32	PA7 *	I/O	GPIO_Output	LED2
48	VCAP_1	Power		
49	VSS	Power		
50	VDD	Power		
51	PB12 *	I/O	GPIO_Input	UART5RX
52	PB13 *	I/O	GPIO_Input	UART5TX
55	PD8 *	I/O	GPIO_Input	UART3TX
56	PD9 *	I/O	GPIO_Input	UART3RX
61	PD14 *	I/O	GPIO_Input	UART6RX
62	PD15 *	I/O	GPIO_Input	UART6TX
63	PC6 *	I/O	GPIO_Input	UART1TX
64	PC7 *	I/O	GPIO_Input	UART1RX
72	PA13	I/O	SYS_JTMS-SWDIO	
73	VCAP_2	Power		
74	VSS	Power		
75	VDD	Power		
76	PA14	I/O	SYS_JTCK-SWCLK	

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
81	PD0	I/O	CAN1_RX	
82	PD1	I/O	CAN1_TX	
94	BOOT0	Boot		
99	VSS	Power		
100	VDD	Power		

* The pin is affected with an I/O function

4. Clock Tree Configuration



5. IPs and Middleware Configuration

5.1. CAN1

mode: Mode

5.1.1. Parameter Settings:

Bit Timings Parameters:

Prescaler (for Time Quantum)	**5 ***
Time Quantum	**100.0 ***
Time Quanta in Bit Segment 1	**6 Times ***
Time Quanta in Bit Segment 2	**3 Times ***
Time for one Bit	1000
ReSynchronization Jump Width	1 Time

Basic Parameters:

Time Triggered Communication Mode	Disable
Automatic Bus-Off Management	**Enable ***
Automatic Wake-Up Mode	Disable
No-Automatic Retransmission	Disable
Receive Fifo Locked Mode	Disable
Transmit Fifo Priority	**Enable ***

Advanced Parameters:

Operating Mode	Normal

5.2. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

5.2.1. Parameter Settings:

System Parameters:

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

RCC Parameters:

HSI Calibration Value	16
TIM Prescaler Selection	Disabled
HSE Startup Timout Value (ms)	100
LSE Startup Timout Value (ms)	5000

Power Parameters:

Power Regulatror Voltage Scale	Power Regulator Voltage Scale 1

5.3. SYS

Debug: Serial Wire

Timebase Source: SysTick

5.4. FREERTOS

mode: Enabled

5.4.1. Config parameters:

Versions:

FreeRTOS version	8.2.3
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	**Enabled ***
QUEUE_REGISTRY_SIZE	8
USE_APPLICATION_TASK_TAG	Disabled
USE_ALTERNATIVE_API	Disabled
ENABLE_BACKWARD_COMPATIBILITY	Enabled
USE_PORT_OPTIMISED_TASK_SELECTION	**Enabled ***
USE_TICKLESS_IDLE	Disabled

USE_TASK_NOTIFICATIONS	Enabled

Memory management settings:

TOTAL_HEAP_SIZE	**25360 ***
Memory Management scheme	heap_4

Hook function related definitions:

USE_IDLE_HOOK	Disabled
USE_TICK_HOOK	Disabled
USE_MALLOC_FAILED_HOOK	Disabled
CHECK_FOR_STACK_OVERFLOW	Disabled

Run time and task stats gathering related definitions:

USE_TRACE_FACILITY	Enabled
GENERATE_RUN_TIME_STATS	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	15
LIBRARY_MAX_SYSCALL_INTERRUPT_PRIORITY	5

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	**Enabled ***
xTaskGetCurrentTaskHandle	Disabled
eTaskGetState	Disabled
xEventGroupSetBitFromISR	Disabled
xTimerPendFunctionCall	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
CAN1	PD0	CAN1_RX	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
	PD1	CAN1_TX	Alternate Function Push Pull	No pull-up and no pull-down	**High ***	
RCC	PH0 - OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	
	PH1 - 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	
GPIO	PE2	GPIO_Input	Input mode	**Pull-up ***	n/a	UART7RX
	PE3	GPIO_Input	Input mode	**Pull-up ***	n/a	UART7TX
	PA0	GPIO_Input	Input mode	**Pull-up ***	n/a	UART4TX
	PA1	GPIO_Input	Input mode	**Pull-up ***	n/a	UART4RX
	PA2	GPIO_Input	Input mode	**Pull-up ***	n/a	UART2TX
	PA3	GPIO_Input	Input mode	**Pull-up ***	n/a	UART2RX
	PA6	GPIO_Output	Output Push Pull	**Pull-up ***	Low	LED1
	PA7	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED2
	PB12	GPIO_Input	Input mode	**Pull-up ***	n/a	UART5RX
	PB13	GPIO_Input	Input mode	**Pull-up ***	n/a	UART5TX
	PD8	GPIO_Input	Input mode	**Pull-up ***	n/a	UART3TX
	PD9	GPIO_Input	Input mode	**Pull-up ***	n/a	UART3RX
	PD14	GPIO_Input	Input mode	**Pull-up ***	n/a	UART6RX
	PD15	GPIO_Input	Input mode	**Pull-up ***	n/a	UART6TX
	PC6	GPIO_Input	Input mode	**Pull-up ***	n/a	UART1TX
	PC7	GPIO_Input	Input mode	**Pull-up ***	n/a	UART1RX

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	15	0
System tick timer	true	15	0
CAN1 TX interrupts	true	5	0
CAN1 RX1 interrupt	true	5	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
CAN1 RX0 interrupts	unused		
CAN1 SCE interrupt	unused		
FPU global interrupt	unused		

*** User modified value**

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32F4
Line	STM32F413/423
MCU	STM32F413VGTx
Datasheet	029162_Rev2

7.2. Parameter Selection

Temperature	25
Vdd	null

8. Software Project

8.1. Project Settings

Name	Value
Project Name	SingleBoard
Project Folder	D:\02--GIT_ZERO2\14--IO\IOSingleBoard
Toolchain / IDE	MDK-ARM V5
Firmware Package Name and Version	STM32Cube FW_F4 V1.14.0

8.2. Code Generation Settings

Name	Value
STM32Cube Firmware Library Package	Add necessary library files as reference in the toolchain project configuration file
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