1. Description

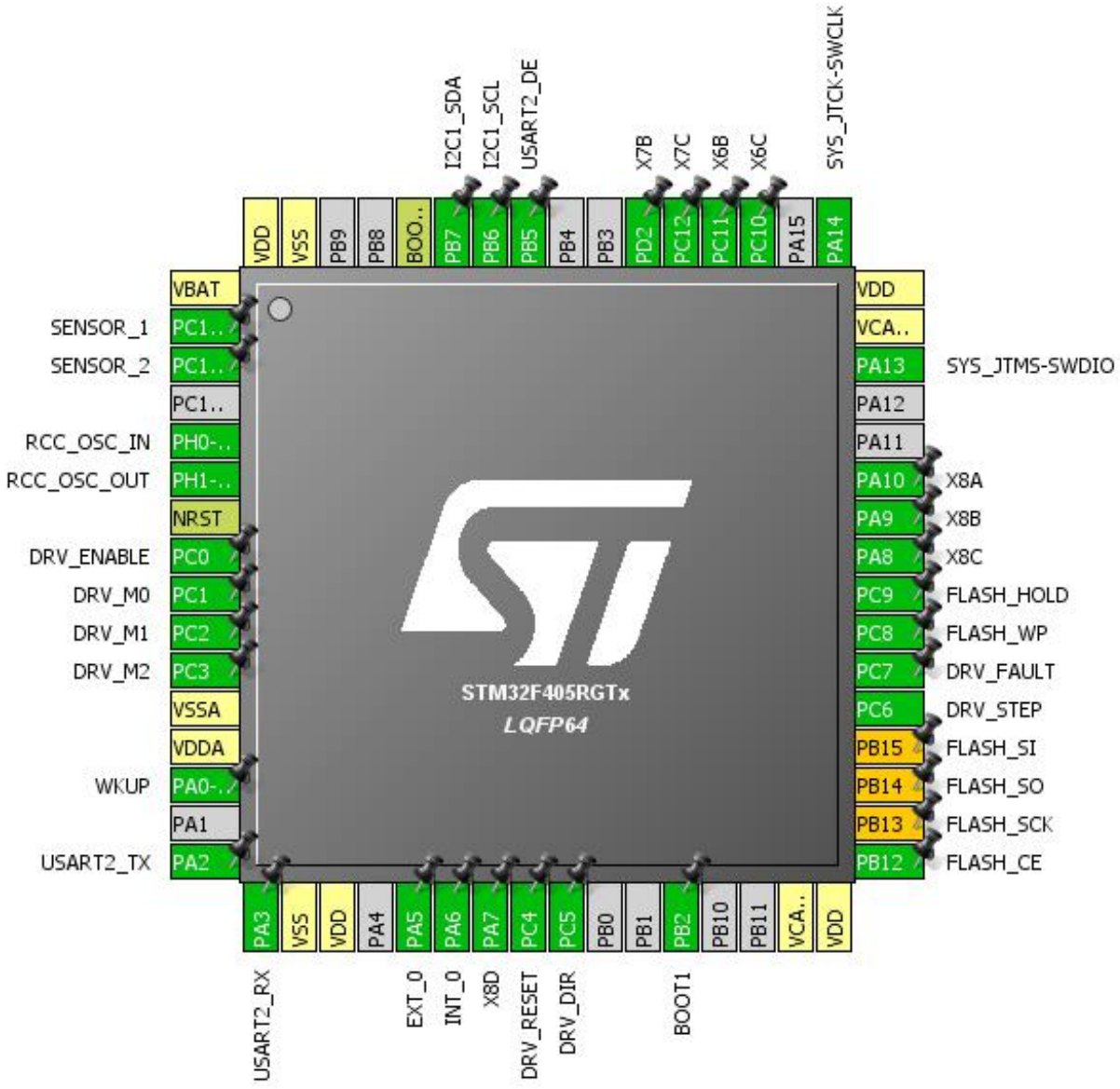
1.1. Project

Project Name	CK_STM32F405(EX-2)
Board Name	custom
Generated with:	STM32CubeMX 4.27.0
Date	12/15/2021

1.2. MCU

MCU Series	STM32F4
MCU Line	STM32F405/415
MCU name	STM32F405RGTx
MCU Package	LQFP64
MCU Pin number	64

2. Pinout Configuration



3. Pins Configuration

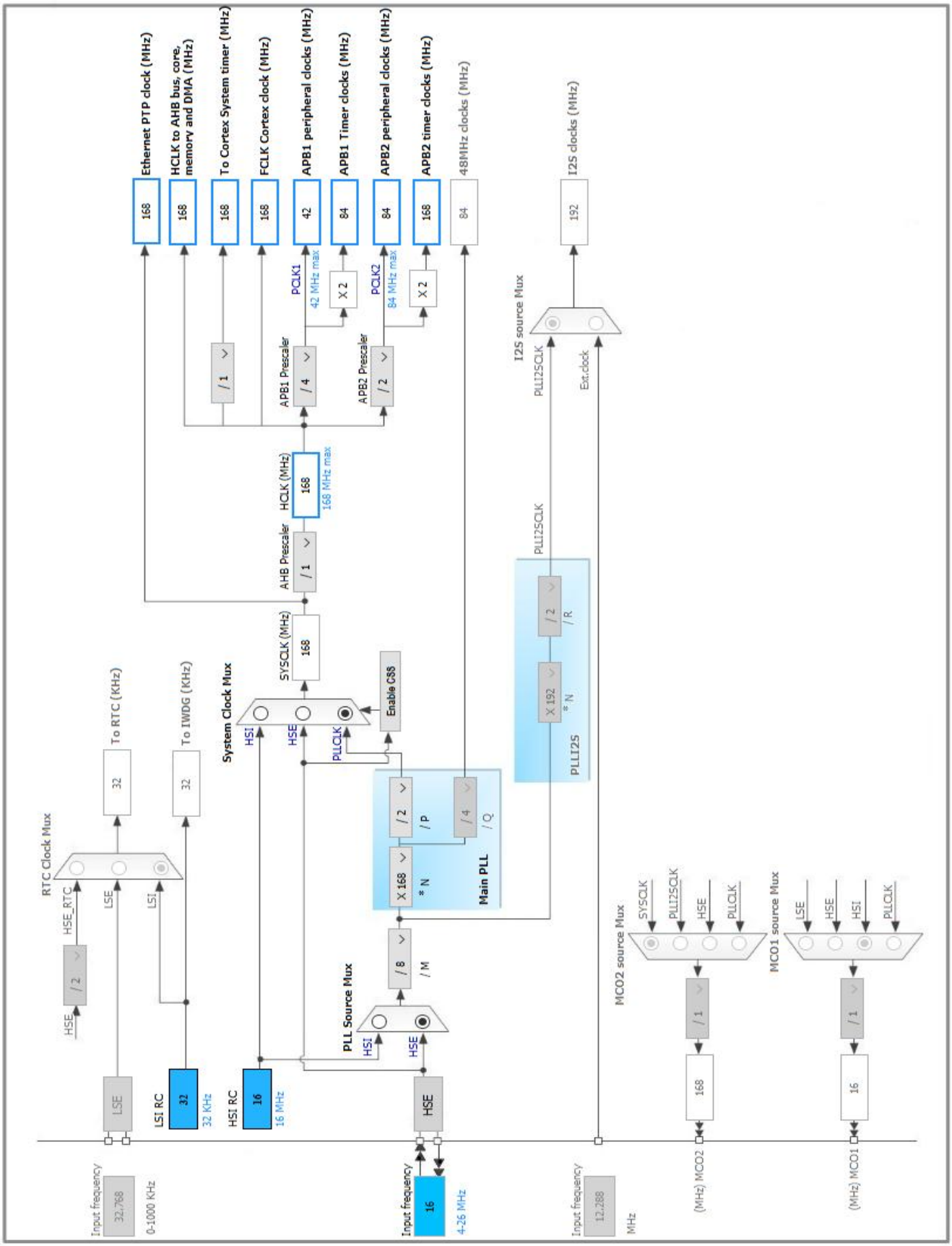
Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
2	PC13-ANTI_TAMP *	I/O	GPIO_Input	SENSOR_1
3	PC14-OSC32_IN *	I/O	GPIO_Input	SENSOR_2
5	PH0-OSC_IN	I/O	RCC_OSC_IN	
6	PH1-OSC_OUT	I/O	RCC_OSC_OUT	
7	NRST	Reset		
8	PC0 *	I/O	GPIO_Output	DRV_ENABLE
9	PC1 *	I/O	GPIO_Output	DRV_M0
10	PC2 *	I/O	GPIO_Output	DRV_M1
11	PC3 *	I/O	GPIO_Output	DRV_M2
12	VSSA	Power		
13	VDDA	Power		
14	PA0-WKUP *	I/O	GPIO_Input	WKUP
16	PA2	I/O	USART2_TX	
17	PA3	I/O	USART2_RX	
18	VSS	Power		
19	VDD	Power		
21	PA5 *	I/O	GPIO_Output	EXT_0
22	PA6 *	I/O	GPIO_Input	INT_0
23	PA7 *	I/O	GPIO_Input	X8D
24	PC4 *	I/O	GPIO_Output	DRV_RESET
25	PC5 *	I/O	GPIO_Output	DRV_DIR
28	PB2 *	I/O	GPIO_Input	BOOT1
31	VCAP_1	Power		
32	VDD	Power		
33	PB12 *	I/O	GPIO_Output	FLASH_CE
34	PB13 **	I/O	SPI2_SCK	FLASH_SCK
35	PB14 **	I/O	SPI2_MISO	FLASH_SO
36	PB15 **	I/O	SPI2_MOSI	FLASH_SI
37	PC6	I/O	TIM3_CH1	DRV_STEP
38	PC7 *	I/O	GPIO_Input	DRV_FAULT
39	PC8 *	I/O	GPIO_Output	FLASH_WP
40	PC9 *	I/O	GPIO_Output	FLASH_HOLD
41	PA8 *	I/O	GPIO_Input	X8C
42	PA9 *	I/O	GPIO_Input	X8B
43	PA10 *	I/O	GPIO_Input	X8A

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
46	PA13	I/O	SYS_JTMS-SWDIO	
47	VCAP_2	Power		
48	VDD	Power		
49	PA14	I/O	SYS_JTCK-SWCLK	
51	PC10 *	I/O	GPIO_Output	X6C
52	PC11 *	I/O	GPIO_Input	X6B
53	PC12 *	I/O	GPIO_Input	X7C
54	PD2 *	I/O	GPIO_Input	X7B
57	PB5 *	I/O	GPIO_Output	USART2_DE
58	PB6	I/O	I2C1_SCL	
59	PB7	I/O	I2C1_SDA	
60	BOOT0	Boot		
63	VSS	Power		
64	VDD	Power		

* The pin is affected with an I/O function

** The pin is affected with a peripheral function but no peripheral mode is activated

4. Clock Tree Configuration



5. IPs and Middleware Configuration

5.1. I2C1

I2C: I2C

5.1.1. Parameter Settings:

Master Features:

I2C Speed Mode	Standard Mode
I2C Clock Speed (Hz)	100000

Slave Features:

Clock No Stretch Mode	Disabled
Primary Address Length selection	7-bit
Dual Address Acknowledged	Disabled
Primary slave address	0
General Call address detection	Disabled

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)	5 WS (6 CPU cycle)

RCC Parameters:

HSI Calibration Value	16
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. TIM2

Clock Source : Internal Clock

5.4.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 32 bits value)	**999999 ***
Internal Clock Division (CKD)	No Division

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit)	Disable (Trigger input effect not delayed)
Trigger Event Selection	**Update Event ***

5.5. TIM3

Clock Source : Internal Clock

Channel1: PWM Generation CH1

mode: One Pulse Mode

5.5.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	**83 ***
Counter Mode	Up
Counter Period (AutoReload Register - 16 bits value)	**99 ***
Internal Clock Division (CKD)	No Division

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit)	Disable (Trigger input effect not delayed)
Trigger Event Selection	**Update Event ***

PWM Generation Channel 1:

Mode	PWM mode 1
Pulse (16 bits value)	**9 ***
Fast Mode	Disable
CH Polarity	**Low ***

5.6. TIM5

mode: Clock Source

5.6.1. Parameter Settings:

Counter Settings:

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Counter Period (AutoReload Register - 32 bits value)	**999999 ***
Internal Clock Division (CKD)	No Division

Trigger Output (TRGO) Parameters:

Master/Slave Mode (MSM bit)	Disable (Trigger input effect not delayed)
Trigger Event Selection	**Update Event ***

5.7. USART2

Mode: Asynchronous

5.7.1. Parameter Settings:

Basic Parameters:

Baud Rate	**840000 ***
Word Length	8 Bits (including Parity)
Parity	None
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples

*** 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	**Very High** *	
	PB7	I2C1_SDA	Alternate Function Open Drain	Pull-up	**Very 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	
TIM3	PC6	TIM3_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	DRV_STEP
USART2	PA2	USART2_TX	Alternate Function Push Pull	Pull-up	**Very High** *	
	PA3	USART2_RX	Alternate Function Push Pull	Pull-up	**Very High** *	
Single Mapped Signals	PB13	SPI2_SCK	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	FLASH_SCK
	PB14	SPI2_MISO	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	FLASH_SO
	PB15	SPI2_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	**Very High** *	FLASH_SI
GPIO	PC13-ANTI_TAMP	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	SENSOR_1
	PC14-OSC32_IN	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	SENSOR_2
	PC0	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DRV_ENABLE
	PC1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DRV_M0
	PC2	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DRV_M1
	PC3	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DRV_M2
	PA0-WKUP	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	WKUP
	PA5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	EXT_0
	PA6	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	INT_0
	PA7	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	X8D
	PC4	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DRV_RESET

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PC5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	DRV_DIR
	PB2	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	BOOT1
	PB12	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	FLASH_CE
	PC7	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	DRV_FAULT
	PC8	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	FLASH_WP
	PC9	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	FLASH_HOLD
	PA8	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	X8C
	PA9	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	X8B
	PA10	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	X8A
	PC10	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	X6C
	PC11	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	X6B
	PC12	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	X7C
	PD2	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	X7B
	PB5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	USART2_DE

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	0	0
System tick timer	true	2	0
TIM2 global interrupt	true	4	0
TIM3 global interrupt	true	4	0
USART2 global interrupt	true	0	0
TIM5 global interrupt	true	3	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
I2C1 event interrupt	unused		
I2C1 error interrupt	unused		
FPU global interrupt	unused		

*** User modified value**

7. Power Consumption Calculator report

7.1. Microcontroller Selection

Series	STM32F4
Line	STM32F405/415
MCU	STM32F405RGTx
Datasheet	022152_Rev8

7.2. Parameter Selection

Temperature	25
Vdd	3.3

8. Software Project

8.1. Project Settings

Name	Value
Project Name	CK_STM32F405(EX-2)
Project Folder	C:\Users\rekuts\Desktop\Dx\CK_Firmware
Toolchain / IDE	EWARM V8
Firmware Package Name and Version	STM32Cube FW_F4 V1.21.0

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	Yes
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