

1. Description

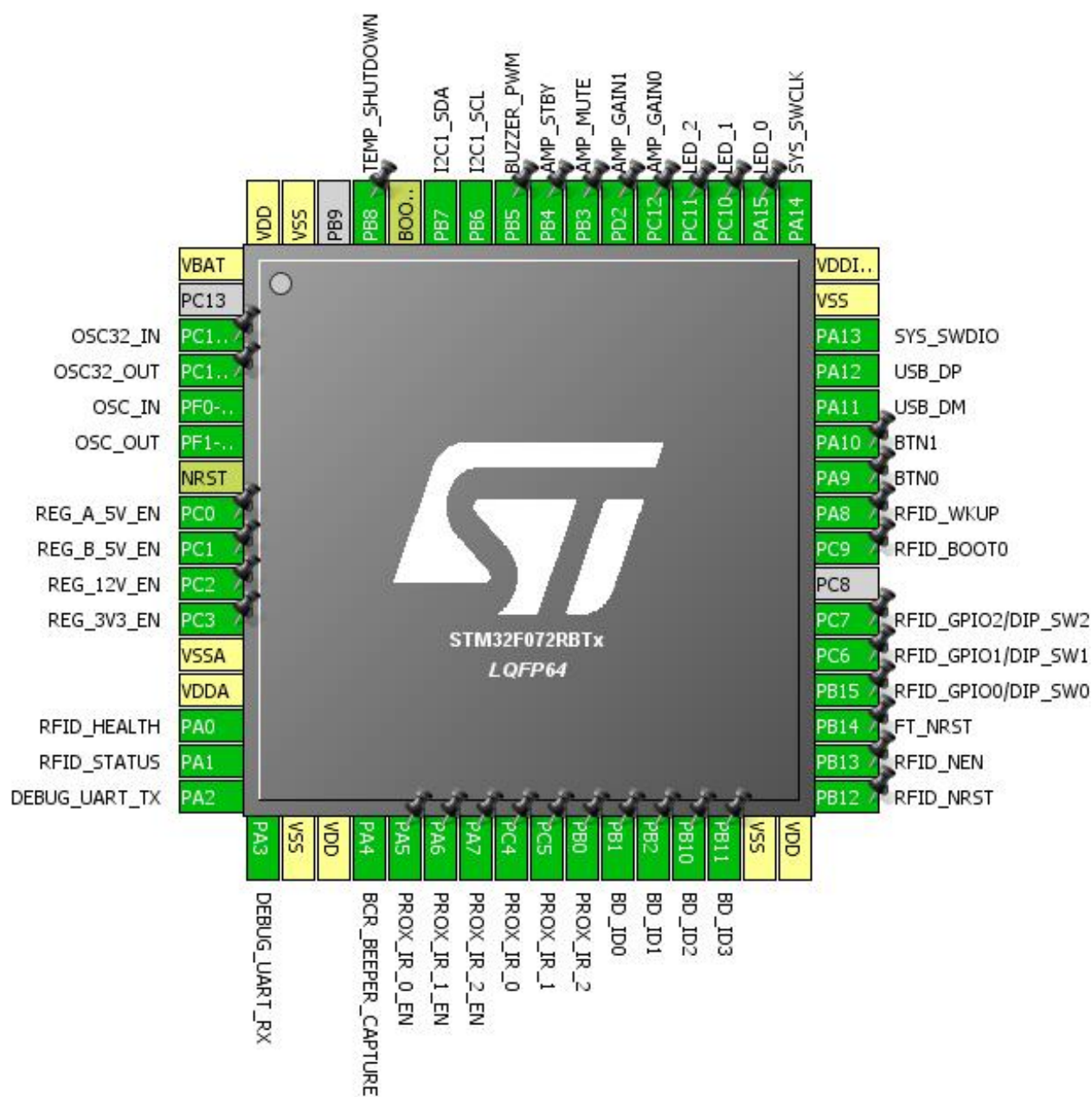
1.1. Project

Project Name	KUBE2_MainFW
Board Name	KUBE2_MainFW
Generated with:	STM32CubeMX 4.12.0
Date	03/02/2016

1.2. MCU

MCU Series	STM32F0
MCU Line	STM32F0x2
MCU name	STM32F072RBTx
MCU Package	LQFP64
MCU Pin number	64

2. Pinout Configuration



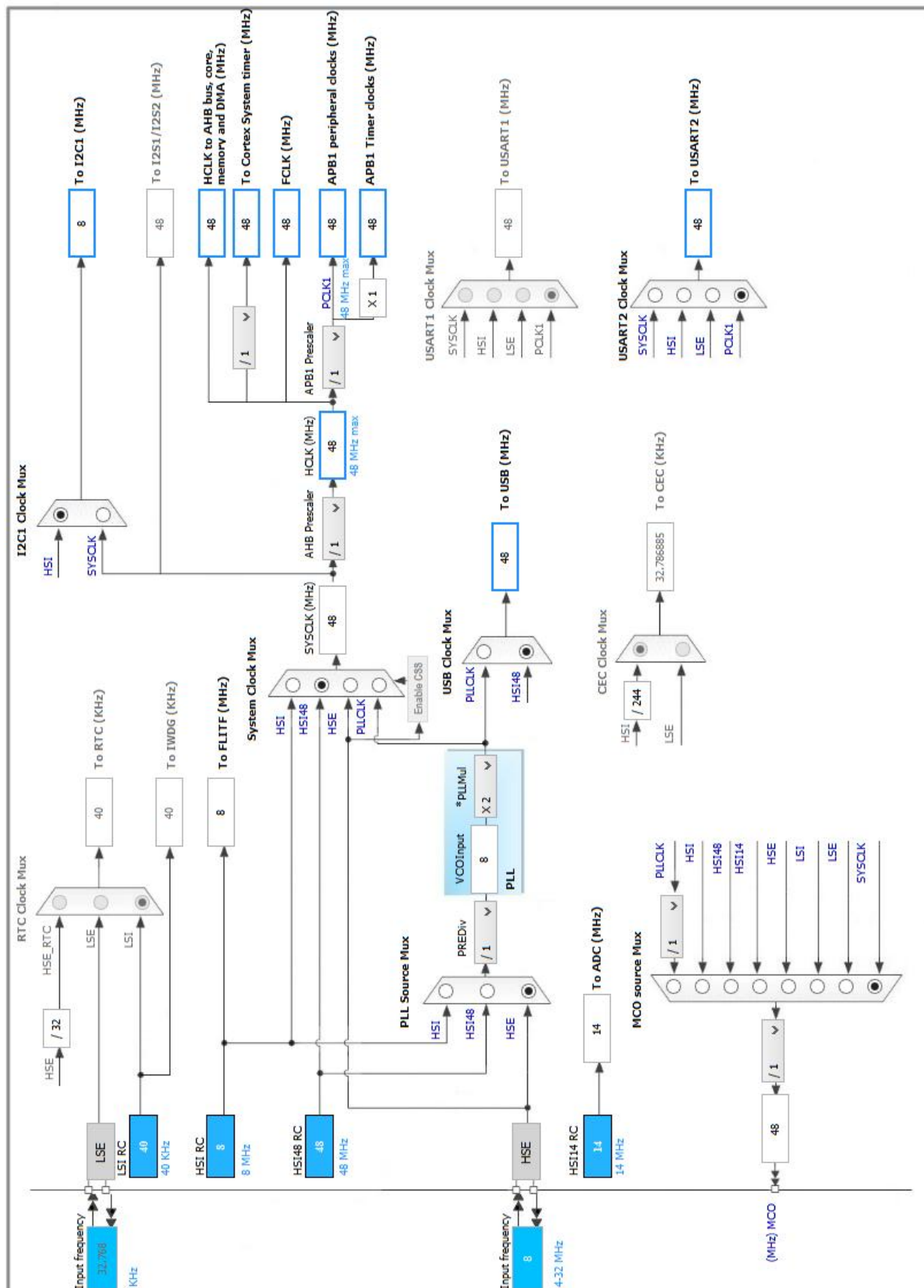
3. Pins Configuration

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
3	PC14-OSC32_IN	I/O	RCC_OSC32_IN	OSC32_IN
4	PC15-OSC32_OUT	I/O	RCC_OSC32_OUT	OSC32_OUT
5	PF0-OSC_IN	I/O	RCC_OSC_IN	OSC_IN
6	PF1-OSC_OUT	I/O	RCC_OSC_OUT	OSC_OUT
7	NRST	Reset		
8	PC0 *	I/O	GPIO_Output	REG_A_5V_EN
9	PC1 *	I/O	GPIO_Output	REG_B_5V_EN
10	PC2 *	I/O	GPIO_Output	REG_12V_EN
11	PC3 *	I/O	GPIO_Output	REG_3V3_EN
12	VSSA	Power		
13	VDDA	Power		
14	PA0	I/O	TIM2_CH1	RFID_HEALTH
15	PA1	I/O	TIM2_CH2	RFID_STATUS
16	PA2	I/O	USART2_TX	DEBUG_UART_TX
17	PA3	I/O	USART2_RX	DEBUG_UART_RX
18	VSS	Power		
19	VDD	Power		
20	PA4	I/O	TIM14_CH1	BCR_BEEPER_CAPTURE
21	PA5 *	I/O	GPIO_Output	PROX_IR_0_EN
22	PA6 *	I/O	GPIO_Output	PROX_IR_1_EN
23	PA7 *	I/O	GPIO_Output	PROX_IR_2_EN
24	PC4	I/O	ADC_IN14	PROX_IR_0
25	PC5	I/O	ADC_IN15	PROX_IR_1
26	PB0	I/O	ADC_IN8	PROX_IR_2
27	PB1 *	I/O	GPIO_Input	BD_ID0
28	PB2 *	I/O	GPIO_Input	BD_ID1
29	PB10 *	I/O	GPIO_Input	BD_ID2
30	PB11 *	I/O	GPIO_Input	BD_ID3
31	VSS	Power		
32	VDD	Power		
33	PB12 *	I/O	GPIO_Output	RFID_NRST
34	PB13 *	I/O	GPIO_Output	RFID_NEN
35	PB14 *	I/O	GPIO_Output	FT_NRST
36	PB15 *	I/O	GPIO_Input	RFID_GPIO0/DIP_SW0
37	PC6 *	I/O	GPIO_Input	RFID_GPIO1/DIP_SW1

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
38	PC7 *	I/O	GPIO_Input	RFID_GPIO2/DIP_SW2
40	PC9 *	I/O	GPIO_Output	RFID_BOOT0
41	PA8 *	I/O	GPIO_Output	RFID_WKUP
42	PA9 *	I/O	GPIO_Input	BTN0
43	PA10 *	I/O	GPIO_Input	BTN1
44	PA11	I/O	USB_DM	
45	PA12	I/O	USB_DP	
46	PA13	I/O	SYS_SWDIO	
47	VSS	Power		
48	VDDIO2	Power		
49	PA14	I/O	SYS_SWCLK	
50	PA15 *	I/O	GPIO_Output	LED_0
51	PC10 *	I/O	GPIO_Output	LED_1
52	PC11 *	I/O	GPIO_Output	LED_2
53	PC12 *	I/O	GPIO_Output	AMP_GAIN0
54	PD2 *	I/O	GPIO_Output	AMP_GAIN1
55	PB3 *	I/O	GPIO_Output	AMP_MUTE
56	PB4 *	I/O	GPIO_Output	AMP_STBY
57	PB5	I/O	TIM3_CH2	BUZZER_PWM
58	PB6	I/O	I2C1_SCL	
59	PB7	I/O	I2C1_SDA	
60	BOOT0	Boot		
61	PB8	I/O	GPIO_EXTI8	TEMP_SHUTDOWN
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. ADC

mode: IN8

mode: IN14

mode: IN15

5.1.1. Parameter Settings:

ADC_Settings:

Clock Prescaler	Asynchronous clock mode
Resolution	ADC 12-bit resolution
Data Alignment	Right alignment
Scan Conversion Mode	Forward
Continuous Conversion Mode	Disabled
Discontinuous Conversion Mode	Disabled
DMA Continuous Requests	Disabled
End Of Conversion Selection	End of single conversion
Overrun behaviour	Overrun data preserved
Low Power Auto Wait	Disabled
Low Power Auto Power Off	Disabled

ADC_Regular_ConversionMode:

Sampling Time	1.5 Cycles
External Trigger Conversion Edge	None

WatchDog:

Enable Analog WatchDog Mode	false
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5.2. I2C1

I2C: I2C

5.2.1. 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

5.3. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

Low Speed Clock (LSE) : Crystal/Ceramic Resonator

5.3.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Instruction Cache	Disabled
Prefetch Buffer	Enabled
Data Cache	Disabled
Flash Latency(WS)	1 WS (2 CPU cycle)

RCC Parameters:

HSI Calibration Value	16
HSI14 Calibration Value	16

5.4. SYS

mode: Serial-WireDebug

5.5. TIM2

Channel1: Input Capture direct mode

Channel2: Input Capture direct mode

5.5.1. Parameter Settings:

Counter Settings:

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

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)

Input Capture Channel 1:

Polarity Selection	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter (4 bits value)	0

Input Capture Channel 2:

Polarity Selection	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter (4 bits value)	0

5.6. TIM3

Channel2: PWM Generation CH2

5.6.1. Parameter Settings:

Counter Settings:

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

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)

PWM Generation Channel 2:

Mode	PWM mode 1
Pulse (16 bits value)	0
Fast Mode	Disable
CH Polarity	High

5.7. TIM14

mode: Activated

Channel1: Input Capture direct mode

5.7.1. Parameter Settings:

Counter Settings:

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

Input Capture Channel 1:

Polarity Selection	Rising Edge
IC Selection	Direct
Prescaler Division Ratio	No division
Input Filter (4 bits value)	0

5.8. USART2

Mode: Asynchronous

5.8.1. Parameter Settings:

Basic Parameters:

Baud Rate	38400
Word Length	7 Bits (including Parity)
Parity	None
Stop Bits	1

Advanced Parameters:

Data Direction	Receive and Transmit
Over Sampling	16 Samples
Single Sample	Disable

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

5.9. USB

mode: Device (FS)

5.9.1. Parameter Settings:

Basic Parameters:

Speed	Full Speed 12MBit/s
Endpoint 0 Max Packet size	8 Bytes
Physical interface	Internal Phy

Power Parameters:

Low Power	Disabled
Battery Charging	Disabled

5.10. USB_DEVICE

Class For FS IP: Human Interface Device Class (HID)

5.10.1. 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

5.10.2. 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)

22315

PRODUCT_STRING (Product Identifier)

STM32 Human interface

SERIALNUMBER_STRING (Serial number)

00000000001A

CONFIGURATION_STRING (Configuration Identifier)

HID Config

INTERFACE_STRING (Interface Identifier)

HID 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
ADC	PC4	ADC_IN14	Analog mode	n/a	n/a	PROX_IR_0
	PC5	ADC_IN15	Analog mode	n/a	n/a	PROX_IR_1
	PB0	ADC_IN8	Analog mode	n/a	n/a	PROX_IR_2
I2C1	PB6	I2C1_SCL	Alternate Function Open Drain	n/a	High *	
	PB7	I2C1_SDA	Alternate Function Open Drain	n/a	High *	
RCC	PC14-OSC32_IN	RCC_OSC32_IN	n/a	n/a	n/a	OSC32_IN
	PC15-OSC32_OUT	RCC_OSC32_OUT	n/a	n/a	n/a	OSC32_OUT
	PF0-OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	OSC_IN
	PF1-OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	OSC_OUT
SYS	PA13	SYS_SWDIO	n/a	n/a	n/a	
	PA14	SYS_SWCLK	n/a	n/a	n/a	
TIM2	PA0	TIM2_CH1	Alternate Function Push Pull	n/a	Low	RFID_HEALTH
	PA1	TIM2_CH2	Alternate Function Push Pull	n/a	Low	RFID_STATUS
TIM3	PB5	TIM3_CH2	Alternate Function Push Pull	n/a	Low	BUZZER_PWM
TIM14	PA4	TIM14_CH1	Alternate Function Push Pull	n/a	Low	BCR_BEEPER_CAPTURE
USART2	PA2	USART2_TX	Alternate Function Push Pull	n/a	High *	DEBUG_UART_TX
	PA3	USART2_RX	Alternate Function Push Pull	n/a	High *	DEBUG_UART_RX
USB	PA11	USB_DM	n/a	n/a	n/a	
	PA12	USB_DP	n/a	n/a	n/a	
GPIO	PC0	GPIO_Output	Output Push Pull	n/a	Low	REG_A_5V_EN
	PC1	GPIO_Output	Output Push Pull	n/a	Low	REG_B_5V_EN
	PC2	GPIO_Output	Output Push Pull	n/a	Low	REG_12V_EN
	PC3	GPIO_Output	Output Push Pull	n/a	Low	REG_3V3_EN
	PA5	GPIO_Output	Output Push Pull	n/a	Low	PROX_IR_0_EN
	PA6	GPIO_Output	Output Push Pull	n/a	Low	PROX_IR_1_EN
	PA7	GPIO_Output	Output Push Pull	n/a	Low	PROX_IR_2_EN
	PB1	GPIO_Input	Input mode	n/a	n/a	BD_ID0
	PB2	GPIO_Input	Input mode	n/a	n/a	BD_ID1
	PB10	GPIO_Input	Input mode	n/a	n/a	BD_ID2

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
	PB11	GPIO_Input	Input mode	n/a	n/a	BD_ID3
	PB12	GPIO_Output	Output Push Pull	n/a	Low	RFID_NRST
	PB13	GPIO_Output	Output Push Pull	n/a	Low	RFID_NEN
	PB14	GPIO_Output	Output Push Pull	n/a	Low	FT_NRST
	PB15	GPIO_Input	Input mode	n/a	n/a	RFID_GPIO0/DIP_SW0
	PC6	GPIO_Input	Input mode	n/a	n/a	RFID_GPIO1/DIP_SW1
	PC7	GPIO_Input	Input mode	n/a	n/a	RFID_GPIO2/DIP_SW2
	PC9	GPIO_Output	Output Push Pull	n/a	Low	RFID_BOOT0
	PA8	GPIO_Output	Output Push Pull	n/a	Low	RFID_WKUP
	PA9	GPIO_Input	Input mode	n/a	n/a	BTN0
	PA10	GPIO_Input	Input mode	n/a	n/a	BTN1
	PA15	GPIO_Output	Output Push Pull	n/a	Low	LED_0
	PC10	GPIO_Output	Output Push Pull	n/a	Low	LED_1
	PC11	GPIO_Output	Output Push Pull	n/a	Low	LED_2
	PC12	GPIO_Output	Output Push Pull	n/a	Low	AMP_GAIN0
	PD2	GPIO_Output	Output Push Pull	n/a	Low	AMP_GAIN1
	PB3	GPIO_Output	Output Push Pull	n/a	Low	AMP_MUTE
	PB4	GPIO_Output	Output Push Pull	n/a	Low	AMP_STBY
	PB8	GPIO_EXTI8	External Interrupt Mode with Rising edge trigger detection	n/a	n/a	TEMP_SHUTDOWN

6.2. DMA configuration

nothing configured in DMA service

6.3. NVIC configuration

Interrupt Table	Enable	Preenmption Priority	SubPriority
System tick timer	true	0	0
USB global interrupt / USB wake-up interrupt through EXTI line 18	true	0	0
Non maskable interrupt	unused		
Hard fault interrupt	unused		
PVD and VDDIO2 supply comparator interrupts through EXTI lines 16 and 31	unused		
Flash global interrupt	unused		
RCC and CRS global interrupts	unused		
EXTI line 4 to 15 interrupts	unused		
ADC and COMP interrupts (COMP interrupts through EXTI lines 21 and 22)	unused		
TIM2 global interrupt	unused		
TIM3 global interrupt	unused		
TIM14 global interrupt	unused		
I2C1 event global interrupt / I2C1 wake-up interrupt through EXTI line 23	unused		
USART2 global interrupt / USART2 wake-up interrupt through EXTI line 26	unused		

* User modified value

7. Power Plugin report

7.1. Microcontroller Selection

Series	STM32F0
Line	STM32F0x2
MCU	STM32F072RBTx
Datasheet	025004_Rev2

7.2. Parameter Selection

Temperature	25
Vdd	3.6

8. Software Project

8.1. Project Settings

Name	Value
Project Name	KUBE2_MainFW
Project Folder	E:\PROJECTS\KUBE2\Workspace\2016-03-02\KUBE2_Firmware
Toolchain / IDE	MDK-ARM V5
Firmware Package Name and Version	STM32Cube FW_F0 V1.4.0

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