
STM32
CubeMX

1. Description

1.1. Project

Project Name	PWR_SHUTDOWN
Board Name	NUCLEO-U031R8
Generated with:	STM32CubeMX 6.15.0
Date	09/24/2025

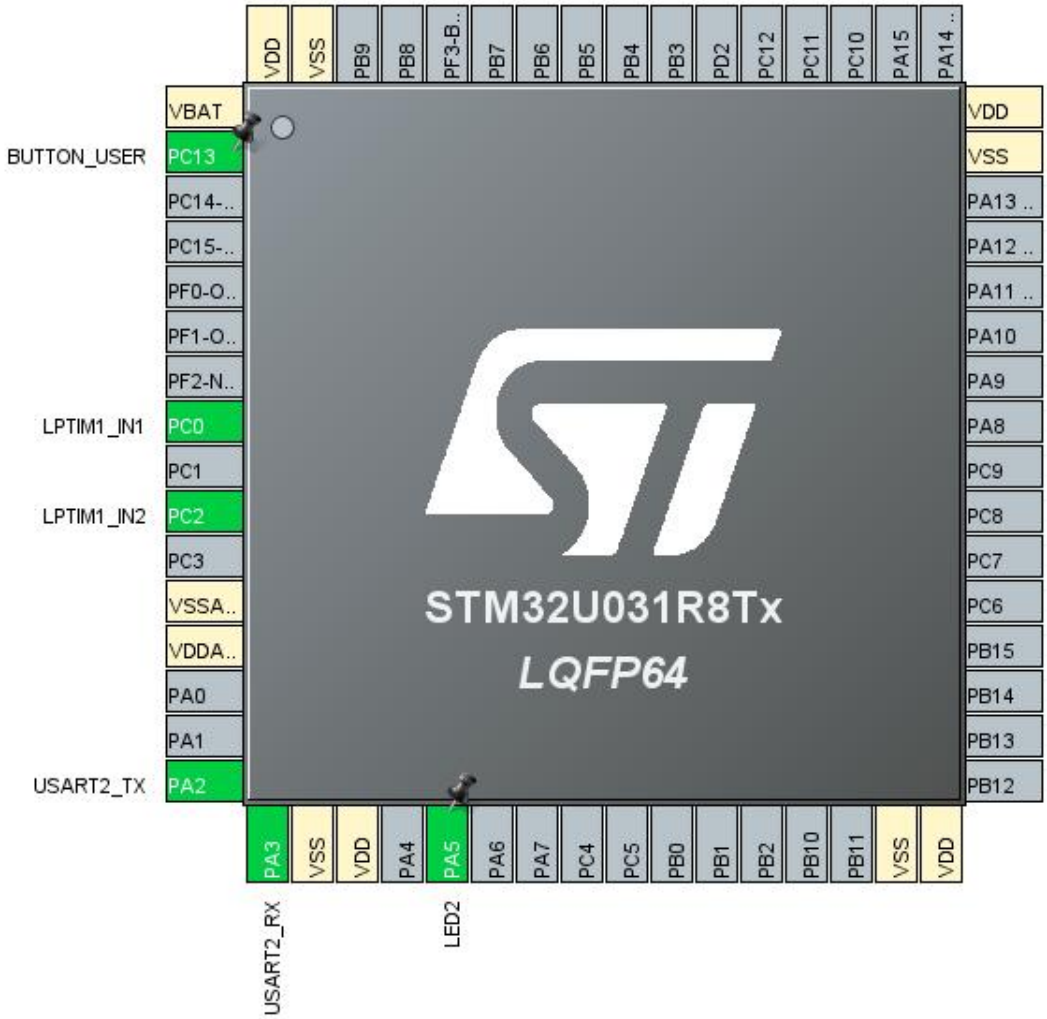
1.2. MCU

MCU Series	STM32U0
MCU Line	STM32U0x1
MCU name	STM32U031R8Tx
MCU Package	LQFP64
MCU Pin number	64

1.3. Core(s) information

Core(s)	ARM Cortex-M0+

2. Pinout Configuration

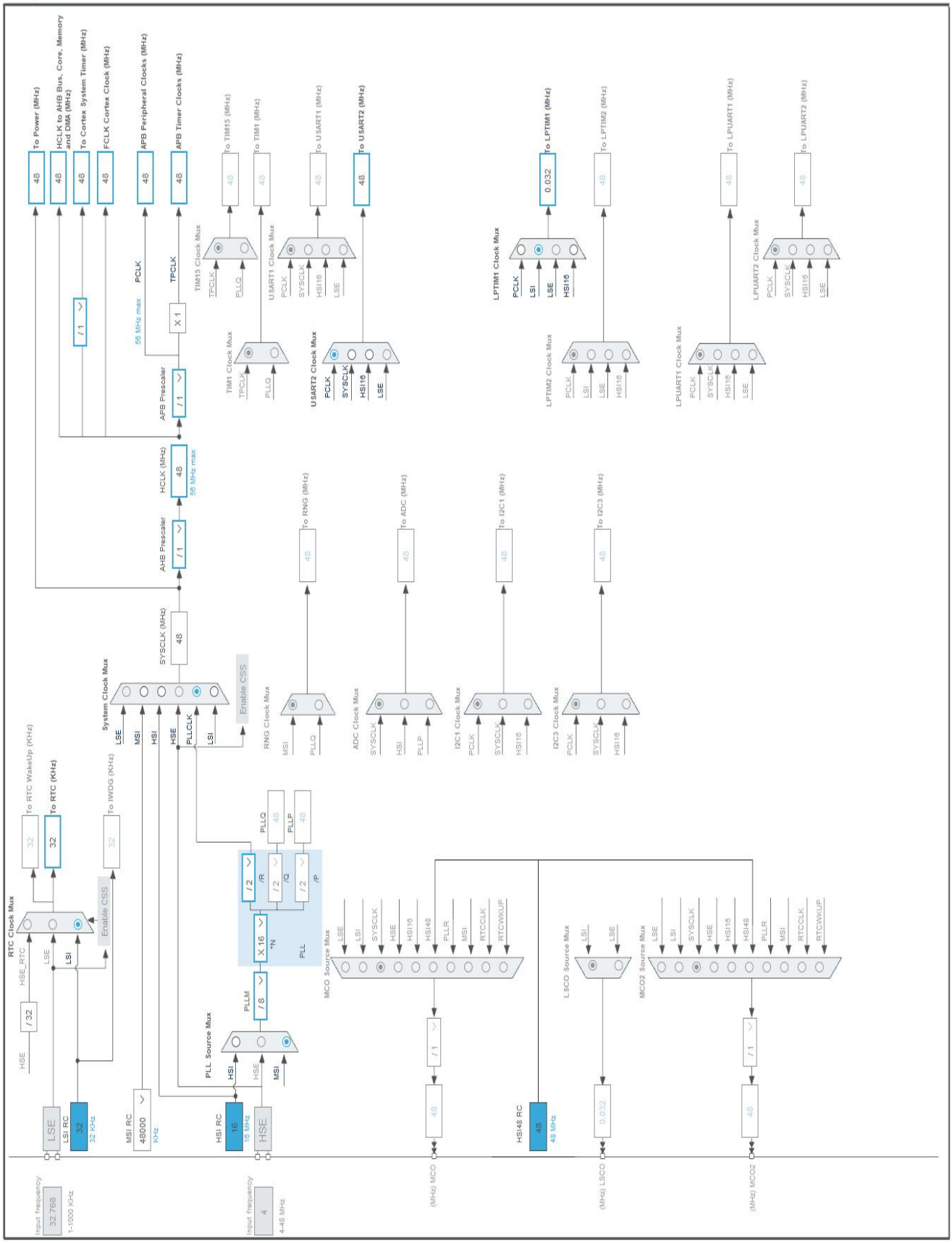


3. Pins Configuration

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
2	PC13	I/O	GPIO_EXTI13	BUTTON_USER
8	PC0	I/O	LPTIM1_IN1	
10	PC2	I/O	LPTIM1_IN2	
12	VSSA/VREF-	Power		
13	VDDA/VREF+	Power		
16	PA2	I/O	USART2_TX	
17	PA3	I/O	USART2_RX	
18	VSS	Power		
19	VDD	Power		
21	PA5 *	I/O	GPIO_Output	LED2
31	VSS	Power		
32	VDD	Power		
47	VSS	Power		
48	VDD	Power		
63	VSS	Power		
64	VDD	Power		

* The pin is affected with an I/O function

4. Clock Tree Configuration



1. Power Consumption Calculator report

1.1. Microcontroller Selection

Series	STM32U0
Line	STM32U0x1
MCU	STM32U031R8Tx
Datasheet	DS00000_Rev0

1.2. Parameter Selection

Temperature	25
Vdd	3.3

1.3. 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

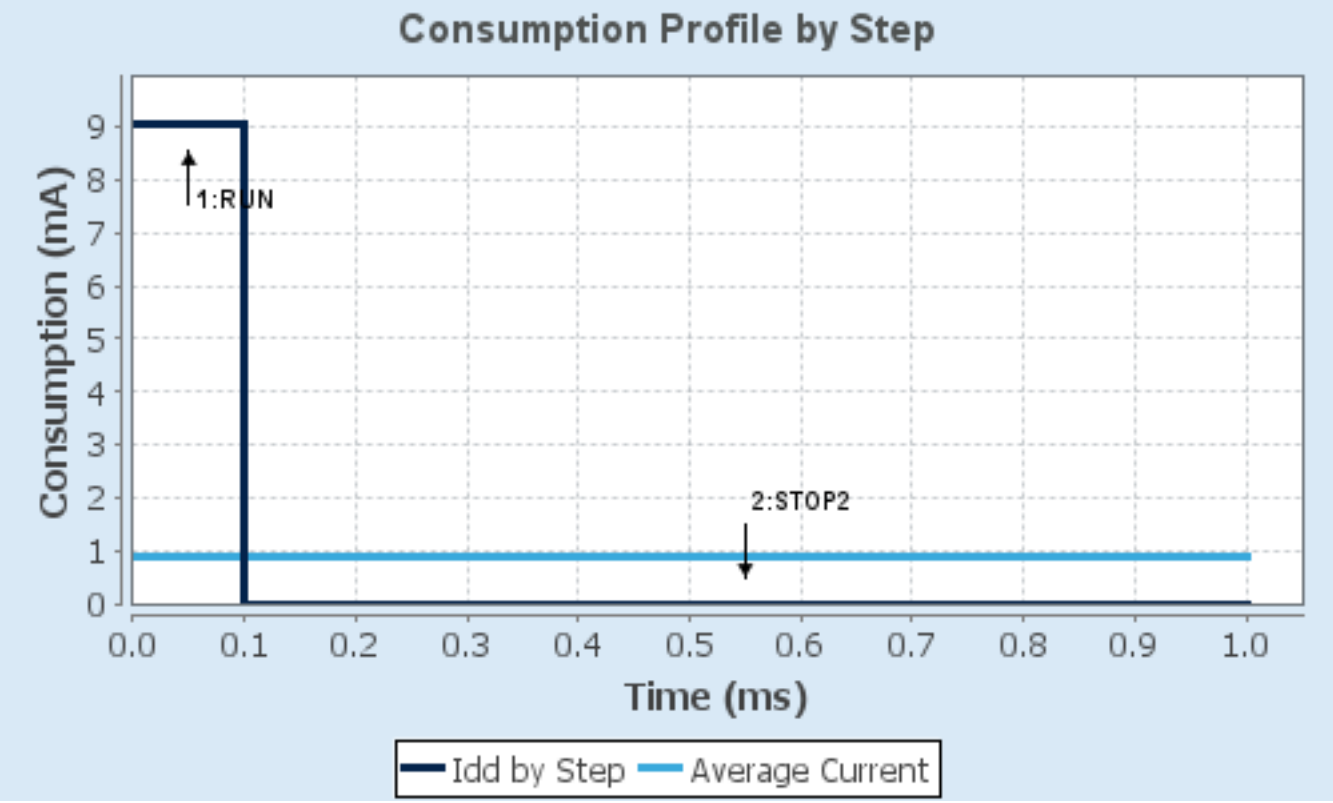
1.4. Sequence

Step	Step1	Step2
Mode	RUN	STOP2
Vdd	3.3	3.3
Voltage Source	Battery	Battery
Range	Range1	NA
Fetch Type	Flash-ON/AlgoType-CoreMark	Flash-ON
CPU Frequency	48 MHz	0 Hz
Clock Configuration	HSE BYP ALL_IPs_ON ALL_RAM_RETENTION	ALL_CLOCKS_OFF IP1 : PWR ULPM ALL_RAM_RETENTION
Clock Source Frequency	48 MHz	0 Hz
Peripherals		
Additional Cons.	0 mA	0 mA
Average Current	9.04 mA	579 nA
Duration	0.1 ms	0.9 ms
DMIPS	0.0	0.0
Ta Max	101.96	105
Category	In DS Table	In DS Table

1.5. Results

Sequence Time	1 ms	Average Current	904.52 µA
Battery Life	5 months, 3 days, 21 hours	Average DMIPS	0.0 DMIPS

1.6. Chart


Consumption Profile by Step
Consumption (mA)
9
8
7
6
5
4
3
2
1
0
1:RUN
2:STOP2
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
1.0
Time (ms)
Idd by Step
Average Current

2. Software Project

2.1. Project Settings

Name	Value
Project Name	PWR_SHUTDOWN
Project Folder	C:\Users\yee-
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_U0 V1.3.0
Application Structure	Basic
Generate Under Root	No
Do not generate the main()	No
Minimum Heap Size	0x200
Minimum Stack Size	0x400

2.2. 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

2.3. Advanced Settings - Generated Function Calls

Rank	Function Name	Peripheral Instance Name
1	SystemClock_Config	RCC
2	MX_GPIO_Init	GPIO
3	MX_USART2_UART_Init	USART2
4	MX_LPTIM1_Init	LPTIM1
5	MX_RTC_Init	RTC

3. Peripherals and Middlewares Configuration

3.1. LPTIM1

Mode: Encoder mode from IN1 IN2

3.1.1. Parameter Settings:

Clock:

ULP Clock Polarity	Rising Edge
ULP Clock Sample Time	Direct Transition

Counter:

Period	65535
Repetition counter	0

Preload:

Update Mode	Update Immediate

Trigger:

Trigger Source	Software Trigger

3.2. PWR

mode: Privilege attributes

3.3. RCC

3.3.1. Parameter Settings:

System Parameters:

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

RCC Parameters:

HSI Calibration Value	64
MSI Calibration Value	18
HSE Startup Timout Value (ms)	100
MSI Auto Calibration	Disabled
LSE Startup Timout Value (ms)	5000

Power Parameters:

Power Regulator Voltage Scale	Power Regulator Voltage Scale 1

Peripherals Clock Configuration:

Generate the peripherals clock configuration	TRUE

3.4. RTC

mode: Activate Clock Source

3.4.1. Parameter Settings:

General:

Hour Format	Hourformat 24
Asynchronous Predivider value	127
Synchronous Predivider value	255
Bin Mode	Free running BCD calender mode

3.5. SYS

Timebase Source: SysTick

3.6. USART2

Mode: Asynchronous

3.6.1. 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
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

*** User modified value**

4. System Configuration

4.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
LPTIM1	PC0	LPTIM1_IN1	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PC2	LPTIM1_IN2	Alternate Function Push Pull	No pull-up and no pull-down	Low	
USART2	PA2	USART2_TX	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA3	USART2_RX	Alternate Function Push Pull	No pull-up and no pull-down	Low	
GPIO	PC13	GPIO_EXTI13	**External Interrupt Mode with Falling edge trigger detection**	**Pull-up ***	n/a	BUTTON_USER
	PA5	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED2

4.2. DMA configuration

nothing configured in DMA service

4.3. NVIC configuration

4.3.1. NVIC

Interrupt Table	Enable	Preenmption Priority	SubPriority
Non maskable interrupt	true	0	0
Hard fault interrupt	true	0	0
System service call via SVC instruction	true	0	0
Pendable request for system service	true	0	0
System tick timer	true	0	0
EXTI line 4 to 15 interrupts	true	0	0
TIM6, DAC and LPTIM1 global Interrupts (combined with EXTI 31)	true	0	0
PVD through EXTI Line detection Interrupt(EXTI lines 16/19/20/21)	unused		
FLASH global Interrupt + FLASH ECC interrupt	unused		
RCC and CRS global interrupt	unused		
USART2 global interrupt (combined with EXTI 26) + LPUART2 global interrupt (combined with EXTI lines 35)	unused		

4.3.2. NVIC Code generation

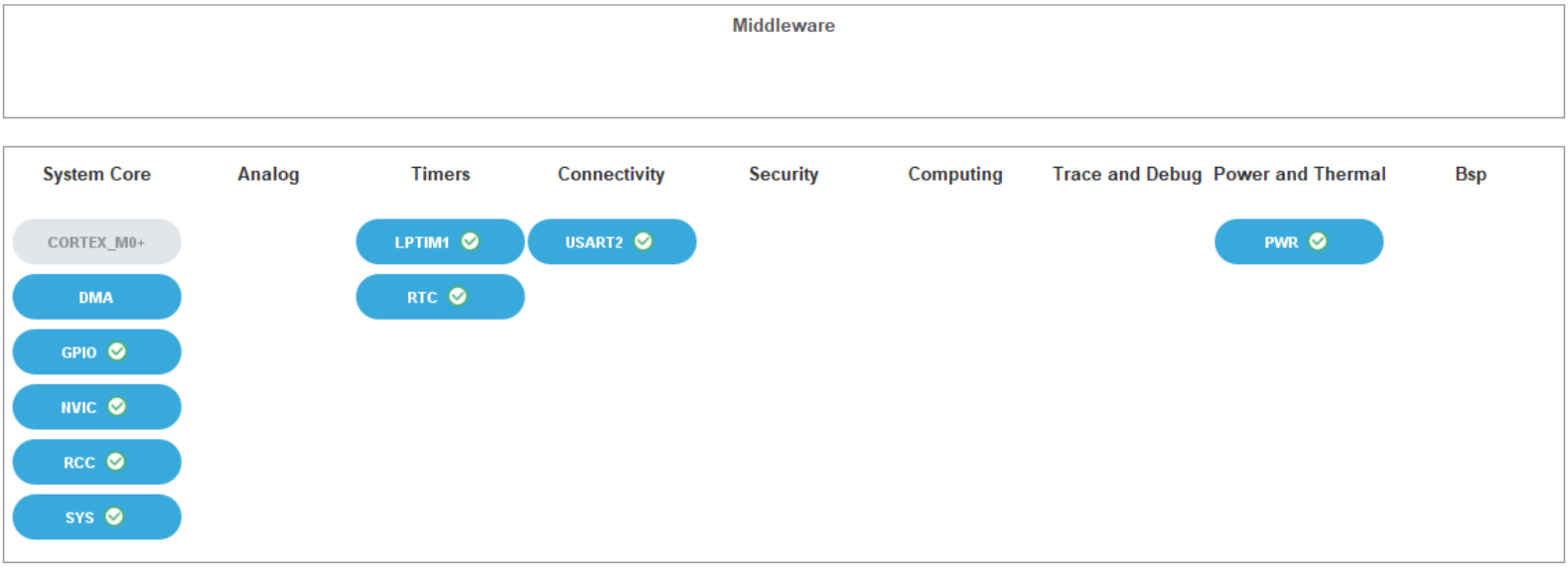
Enabled interrupt Table	Select for init sequence ordering	Generate IRQ handler	Call HAL handler
Non maskable interrupt	false	false	false
Hard fault interrupt	false	false	false
System service call via SVC instruction	false	true	false
Pendable request for system service	false	true	false
System tick timer	false	true	true
EXTI line 4 to 15 interrupts	false	true	true
TIM6, DAC and LPTIM1 global Interrupts (combined with EXTI 31)	false	true	true

*** User modified value**

5. System Views

5.1. Category view

5.1.1. Current



6. Docs & Resources

Type	Link