
STM32
CubeMX

1. Description

1.1. Project

Project Name	LCD_PASS_CHECK
Board Name	NUCLEO-WBA52CG
Generated with:	STM32CubeMX 6.12.0
Date	10/01/2024

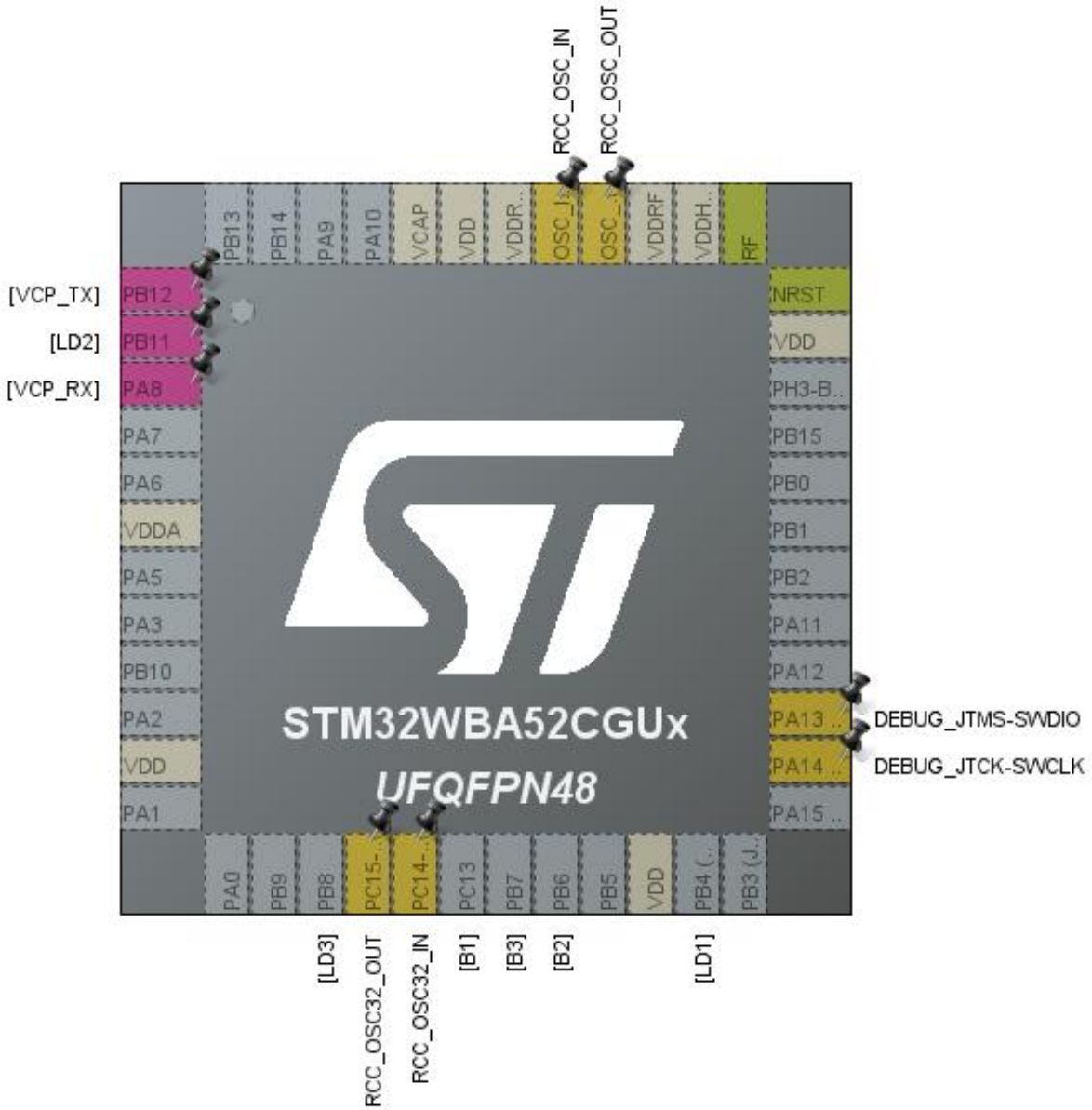
1.2. MCU

MCU Series	STM32WBA
MCU Line	STM32WBAx2
MCU name	STM32WBA52CGUx
MCU Package	UFQFPN48
MCU Pin number	49

1.3. Core(s) information

Core(s)	ARM Cortex-M33

2. Pinout Configuration

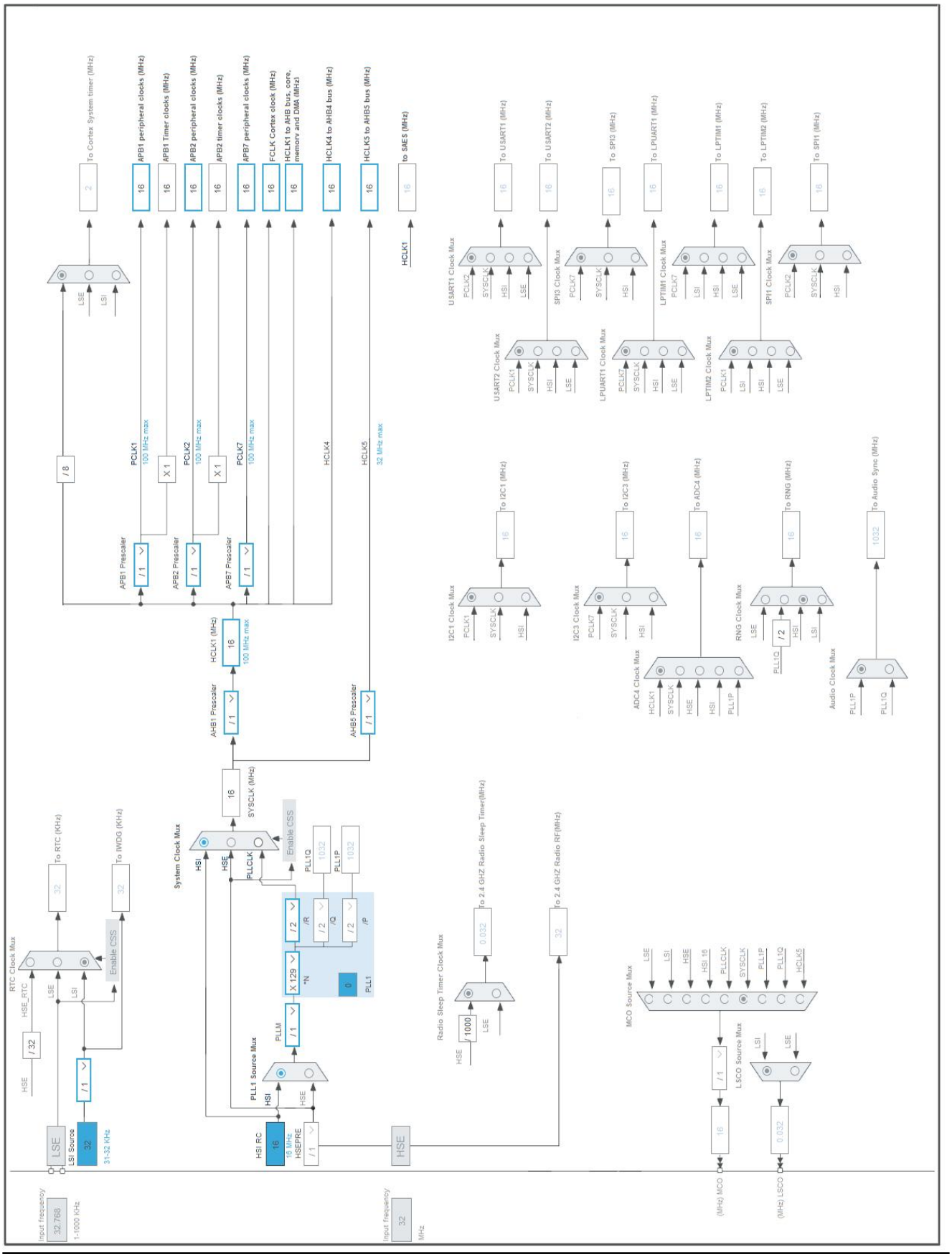


3. Pins Configuration

Pin Number UFQFPN48	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	PB12	I/O		
2	PB11	I/O		
3	PA8	I/O		
6	VDDA	Power		
11	VDD	Power		
16	PC15-OSC32_OUT *	I/O	RCC_OSC32_OUT	RCC_OSC32_OUT
17	PC14-OSC32_IN *	I/O	RCC_OSC32_IN	RCC_OSC32_IN
22	VDD	Power		
26	PA14 (JTCK/SWCLK) *	I/O	DEBUG_JTCK-SWCLK	DEBUG_JTCK-SWCLK
27	PA13 (JTMS/SWDIO) *	I/O	DEBUG_JTMS-SWDIO	DEBUG_JTMS-SWDIO
35	VDD	Power		
36	NRST	Reset		
37	RF	MonoIO		
38	VDDHPA	Power		
39	VDDRF	Power		
40	OSC_OUT *	I/O	RCC_OSC_OUT	RCC_OSC_OUT
41	OSC_IN *	I/O	RCC_OSC_IN	RCC_OSC_IN
42	VDDRFPA	Power		
43	VDD	Power		
44	VCAP	Power		
49	VSS (exposed pad)	Power		

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

4. Clock Tree Configuration



1. Power Consumption Calculator report

1.1. Microcontroller Selection

Series	STM32WBA
Line	STM32WBAx2
MCU	STM32WBA52CGUx
Datasheet	DS000000_Rev1

1.2. Parameter Selection

Temperature	25
Vdd	3.0

1.3. Battery Selection

Battery	Li-SOCL2(AAA700)
Capacity	700.0 mAh
Self Discharge	0.08 %/month
Nominal Voltage	3.6 V
Max Cont Current	10.0 mA
Max Pulse Current	30.0 mA
Cells in series	1
Cells in parallel	1

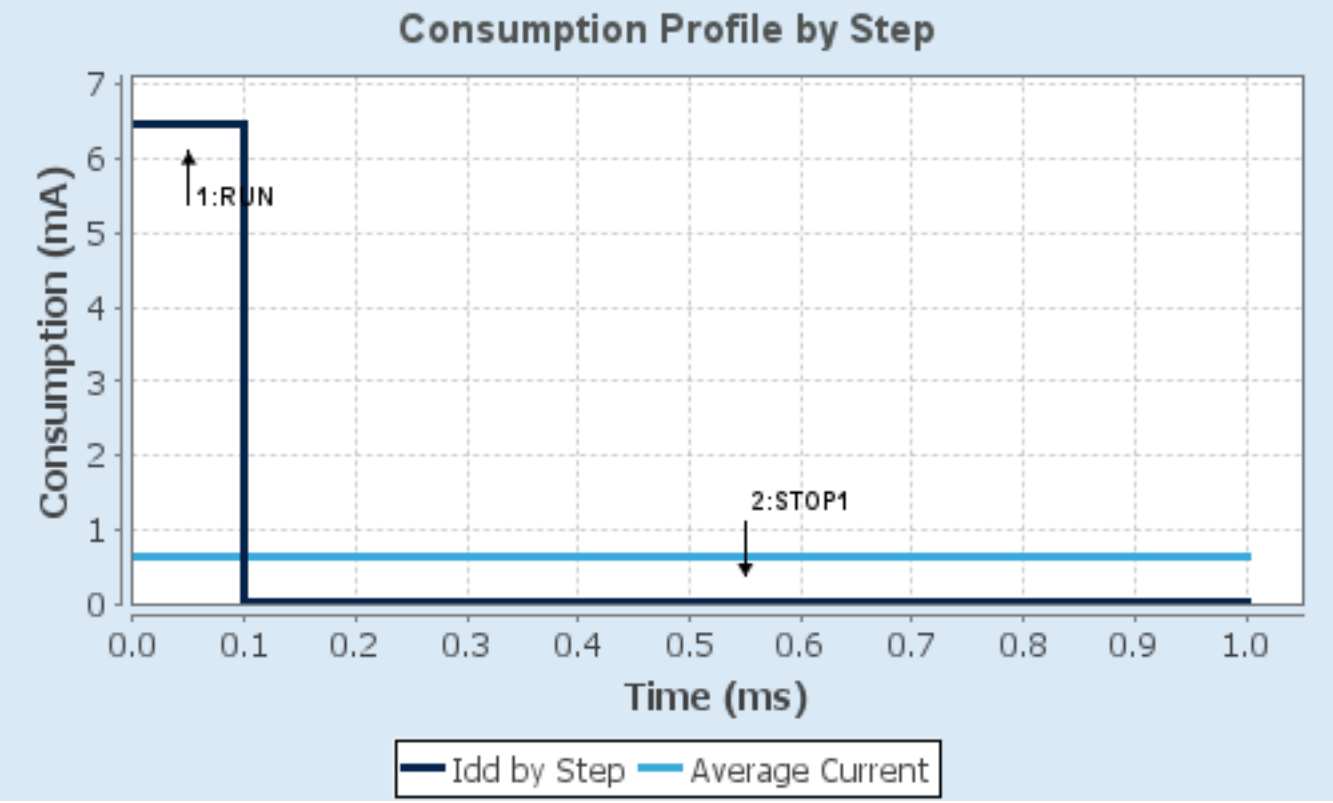
1.4. Sequence

Step	Step1	Step2
Mode	RUN	STOP1
Vdd	3.0	3.0
Voltage Source	Battery	Battery
Range	Range1-High	NoScale/SMPS
Fetch Type	FLASH/Cache_2Ways	FLASH
CPU Frequency	100 MHz	0 Hz
Clock Configuration	HSE BYP PLL ALL_RAM_RETENTION	ALL_CLOCKS_OFF PWR
Clock Source Frequency	32 MHz	0 Hz
Peripherals		
Additional Cons.	0 mA	0 mA
Average Current	6.46 mA	6.48 µA
Duration	0.1 ms	0.9 ms
DMIPS	125.0	0.0
Ta Max	104.48	105
Category	In DS Table	In DS Table

1.5. Results

Sequence Time	1 ms	Average Current	651.83 µA
Battery Life	1 month, 14 days, 6 hours	Average DMIPS	12.5 DMIPS

1.6. Chart


Consumption Profile by Step
Consumption (mA)
7
6
5
4
3
2
1
0
1:RUN
2:STOP1
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	LCD_PASS_CHECK
Project Folder	D:\Micro_Controller\STM32\Projects\LCD_Projects\LCD_PASS_CHECK
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_WBA V1.4.1
Application Structure	Advanced
Generate Under Root	Yes
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	Copy only the necessary library files
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	SystemPower_Config	PWR
4	MX_ICACHE_Init	ICACHE

3. Peripherals and Middlewares Configuration

3.1. ICACHE

Mode: 1-way (direct mapped cache)

3.2. MEMORYMAP

mode: Activated

3.3. NUCLEO-WBA52CG

mode: Human Machine Interface

3.3.1. Human Machine Interface:

Led:	
USER LED BLUE (LD1)	**true ***
USER LED GREEN (LD2)	**true ***
USER LED RED (LD3)	**true ***
Button:	
USER B1	**Mode EXTI ***
USER B2	**Mode EXTI ***
USER B3	**Mode EXTI ***
VCOM:	
Virtual Com Port	**true ***
Demonstration code:	
Generate demonstration code	Disabled

3.4. NUCLEO-WBA52CG

mode: Human Machine Interface

3.4.1. Human Machine Interface:

Led:	
USER LED BLUE (LD1)	**true ***
USER LED GREEN (LD2)	**true ***
USER LED RED (LD3)	**true ***
Button:	
USER B1	**Mode EXTI ***
USER B2	

	Mode EXTI *
USER B3	**Mode EXTI ***
VCOM:	
Virtual Com Port	**true ***
Demonstration code:	
Generate demonstration code	Disabled

3.5. PWR

mode: Privilege attributes

3.5.1. PWR Privilege :

Privilege PWR:	
PWR Privilege	Disable

3.6. RCC

3.6.1. Parameter Settings:

System Parameters:	
VDD voltage (V)	3.3
Prefetch Buffer	Enabled
Flash Latency(WS)	0 WS (1 CPU cycle)
RCC Parameters:	
HSI Calibration Value	16
HSE Startup Timout Value (ms)	100
LSE Startup Timout Value (ms)	5000
HSE Trimming Value	0
LSE Trimming Value	Current Source Resistance R
Power Parameters:	
Power Regulator Voltage Scale	**Power Regulator Voltage Scale 1 ***

3.7. SYS

Timebase Source: SysTick

*** User modified value**

4. System Configuration

4.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
Single Mapped Signals	PC15-OSC32_OUT	RCC_OSC32_OUT	n/a	n/a	n/a	RCC_OSC32_OUT
	PC14-OSC32_IN	RCC_OSC32_IN	n/a	n/a	n/a	RCC_OSC32_IN
	PA14 (JTCK/SWCLK)	DEBUG_JTCK-SWCLK	n/a	n/a	n/a	DEBUG_JTCK-SWCLK
	PA13 (JTMS/SWDIO)	DEBUG_JTMS-SWDIO	n/a	n/a	n/a	DEBUG_JTMS-SWDIO
	OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	RCC_OSC_OUT
	OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	RCC_OSC_IN

4.2. GPDMA1

4.3. LINKEDLIST

4.4. NVIC configuration

4.4.1. NVIC

Interrupt Table	Enable	Preenmption Priority	SubPriority
Non maskable interrupt	true	0	0
Hard fault interrupt	true	0	0
Memory management fault	true	0	0
Prefetch 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	15	0
EXTI Line6 interrupt	true	0	0
EXTI Line7 interrupt	true	0	0
EXTI Line13 interrupt	true	0	0
Flash non-secure global interrupt	unused		
RCC non-secure global interrupt	unused		
FPU global interrupt	unused		
Instruction cache global interrupt	unused		
PWR global WKUP pin interrupt	unused		
RCC audio synchronization interrupt	unused		

4.4.2. NVIC Code generation

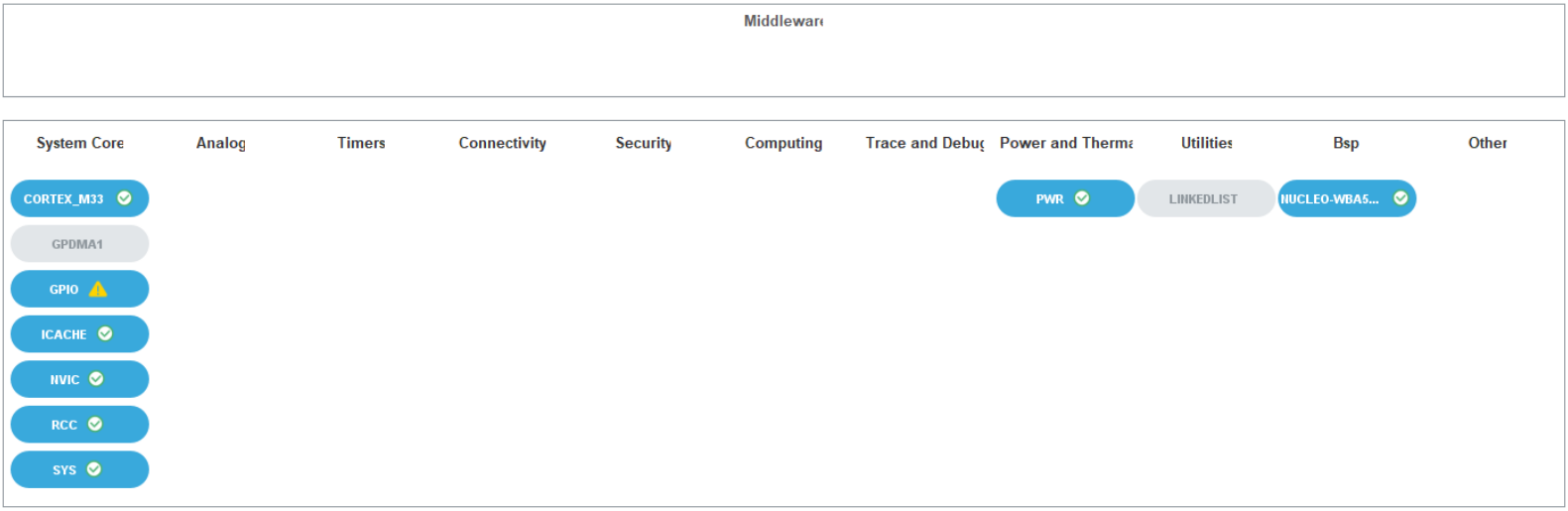
Enabled interrupt Table	Select for init sequence ordering	Generate IRQ handler	Call HAL handler
Non maskable interrupt	false	true	false
Hard fault interrupt	false	true	false
Memory management fault	false	true	false
Prefetch fault, memory access fault	false	true	false
Undefined instruction or illegal state	false	true	false
System service call via SWI instruction	false	true	false
Debug monitor	false	true	false
Pendable request for system service	false	true	false
System tick timer	false	true	true
EXTI Line6 interrupt	false	true	true
EXTI Line7 interrupt	false	true	true
EXTI Line13 interrupt	false	true	true

*** User modified value**

5. System Views

5.1. Category view

5.1.1. Current



6. Docs & Resources

Type	Link
IBIS models	https://www.st.com/resource/en/ibis_model/stm32wba-ibis.zip
Presentations	https://www.st.com/resource/en/product_presentation/stm32-stm8_embedded_software_solutions.pdf
Presentations	https://www.st.com/resource/en/product_presentation/stm32_eval-tools_portfolio.pdf
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Presentations	https://www.st.com/resource/en/product_presentation/microcontrollers-stm32-family-overview.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32nucleo.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32wba.pdf
White Papers	https://www.st.com/resource/en/white_paper/seamless-smart-home-connectivity-with-matter-whitepaper.pdf
Application Notes	https://www.st.com/resource/en/application_note/an1709-emc-design-guide-for-stm8-stm32-and-legacy-mcus-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an2606-stm32-microcontroller-system-memory-boot-mode-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an2639-soldering-recommendations-and-package-information-for-leadfree-ecopack-mcus-and-mpus-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an3126-audio-and-waveform-generation-using-the-dac-in-stm32-products-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an3155-usart-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4221-i2c-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf

Application Notes	https://www.st.com/resource/en/application_note/an4229-how-to-implement-a-vocoder-solution-using-stm32-microcontrollers-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4286-spi-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4655-virtually-increasing-the-number-of-serial-communication-peripherals-in-stm32-applications-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4750-handling-of-soft-errors-in-stm32-applications-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4776-generalpurpose-timer-cookbook-for-stm32-microcontrollers-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4803-highspeed-si-simulations-using-ibis-and-boardlevel-simulations-using-hyperlynx-si-on-stm32-mcus-and-mpus-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an5027-interfacing-pdm-digital-microphones-using-stm32-mcus-and-mpus-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an5105-getting-started-with-touch-sensing-control-on-stm32-microcontrollers-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4899-stm32-microcontroller-gpio-hardware-settings-and-lowpower-consumption-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an5612-esd-protection-of-stm32-mcus-and-mpus-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4991-how-to-wake-up-an-stm32-microcontroller-from-lowpower-mode-with-the-usart-or-the-lpuart-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an5928-how-to-build-a-short-range-wireless-application-with-stm32wba-mcus-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an5042-how-to-calibrate-the-hse-clock-for-rf-applications-on-stm32-wireless-mcus-stmicroelectronics.pdf

Application Notes	https://www.st.com/resource/en/application_note/an5225-introduction-to-usb-typec-power-delivery-for-stm32-mcus-and-mpus-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an2834-how-to-optimize-the-adc-accuracy-in-the-stm32-mcus-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an5886-guidelines-for-design-and-board-assembly-of-land-grid-array-packages-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an5036-guidelines-for-thermal-management-on-stm32-applications-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4230-introduction-to-random-number-generation-validation-using-the-nist-statistical-test-suite-for-stm32-mcus-and-mpus-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an2867-guidelines-for-oscillator-design-on-stm8afals-and-stm32-mcusmpus-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an3236-how-to-increase-the-number-of-touchkeys-for-touch-sensing-applications-on-stm32-mcus-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an3960-guidelines-for-esd-for-touch-sensing-applications-on-stm32-mcus-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4299-how-to-improve-conducted-noise-robustness-for-touch-sensing-applications-on-stm32-mcus-stmicroelectronics.pdf
Application Notes	https://www.st.com/resource/en/application_note/an4310-how-to-choose-the-sampling-capacitor-for-touch-sensing-applications-on-stm32-mcus-stmicroelectronics.pdf
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Application Notes	https://www.st.com/resource/en/application_note/an4759-introduction-to-using-the-hardware-realtime-clock-rtc-and-the-tamper-management-unit-

	tamp-with-stm32-mcus-stmicroelectronics.pdf
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for related Tools & Software	with-projects-based-on-the-stm32mp1-series-in-stm32cubeide-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5361-getting-started-with-projects-based-on-dualcore-stm32h7-microcontrollers-in-stm32cubeide-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5394-getting-started-with-projects-based-on-the-stm32l5-series-in-stm32cubeide-stmicroelectronics.pdf
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& Software	
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Datasheet	https://www.st.com/resource/en/datasheet/dm00921756.pdf
Programming Manuals	https://www.st.com/resource/en/programming_manual/pm0271-guidelines-for-bluetooth-low-energy-stack-programming-on-stm32wb-stm32wba-mcus-stmicroelectronics.pdf
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Technical Notes & Articles	https://www.st.com/resource/en/technical_note/tn1163-description-of-wlcsp-for-microcontrollers-and-recommendations-for-its-use-stmicroelectronics.pdf
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Technical Notes & Articles	https://www.st.com/resource/en/technical_note/tn1206-tape-and-reel-shipping-media-for-stm8-and-stm32-microcontrollers-in-qfp-packages-stmicroelectronics.pdf
Technical Notes & Articles	https://www.st.com/resource/en/technical_note/tn1207-tape-and-reel-shipping-media-for-stm8-and-stm32-microcontrollers-in-so-packages-stmicroelectronics.pdf
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User Manuals	https://www.st.com/resource/en/user_manual/um3142-stm32wba52xx-security-guidance-for-psa-certified-level-3-with-sesip-profile-stmicroelectronics.pdf