

# 1. Description

# 1.1. Project

Project Name	DevEBox
Board Name	custom
Generated with:	STM32CubeMX 6.13.0
Date	02/27/2025

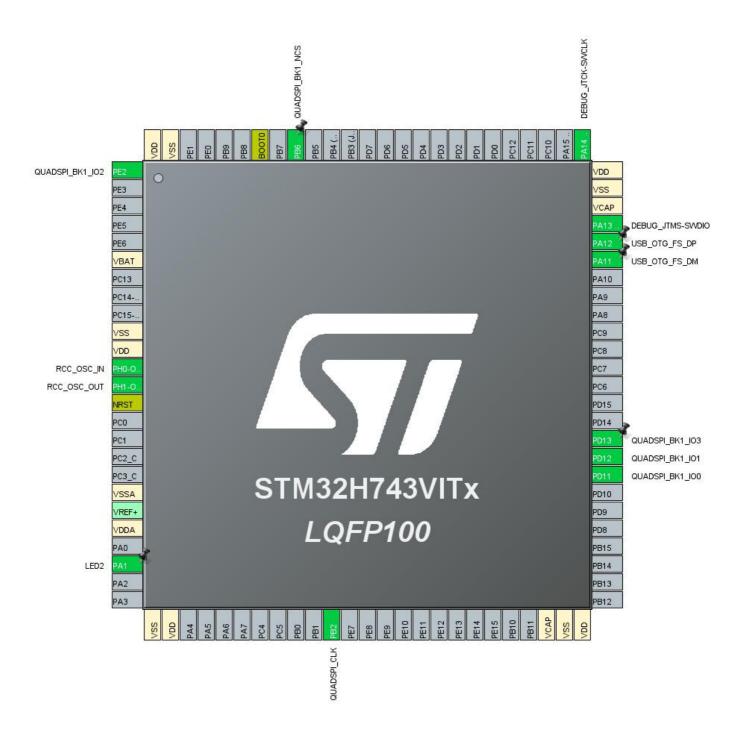
## 1.2. MCU

MCU Series	STM32H7
MCU Line	STM32H743/753
MCU name	STM32H743VITx
MCU Package	LQFP100
MCU Pin number	100

# 1.3. Core(s) information

Core(s)	ARM Cortex-M7

# 2. Pinout Configuration

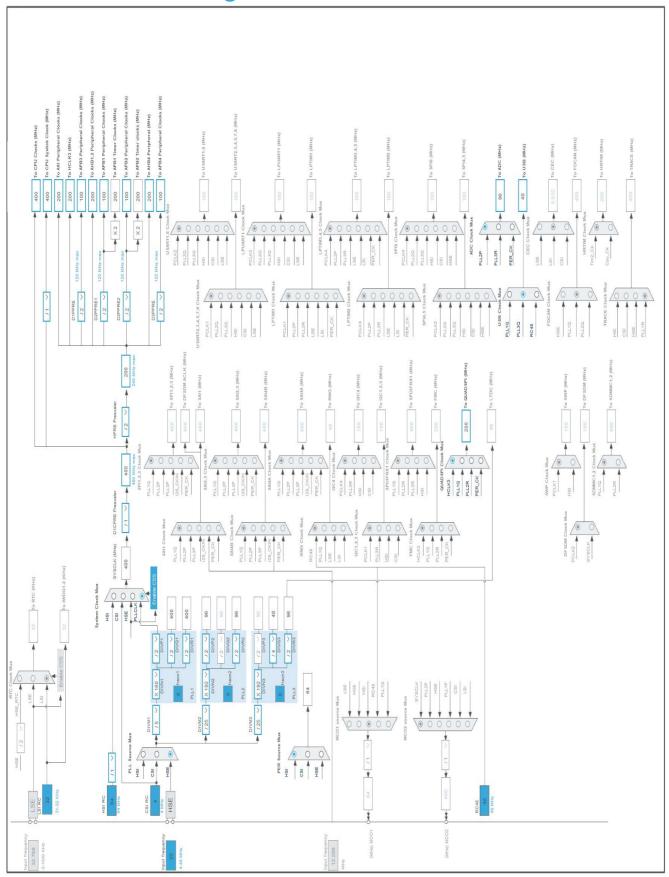


# 3. Pins Configuration

Pin Number LQFP100	Pin Name (function after	Pin Type	Alternate Function(s)	Label
	reset)			
1	PE2	I/O	QUADSPI_BK1_IO2	
6	VBAT	Power		
10	VSS	Power		
11	VDD	Power		
12	PH0-OSC_IN (PH0)	I/O	RCC_OSC_IN	
13	PH1-OSC_OUT (PH1)	I/O	RCC_OSC_OUT	
14	NRST	Reset		
19	VSSA	Power		
21	VDDA	Power		
23	PA1 *	I/O	GPIO_Output	LED2
26	VSS	Power		
27	VDD	Power		
36	PB2	I/O	QUADSPI_CLK	
48	VCAP	Power		
49	VSS	Power		
50	VDD	Power		
58	PD11	I/O	QUADSPI_BK1_IO0	
59	PD12	I/O	QUADSPI_BK1_IO1	
60	PD13	I/O	QUADSPI_BK1_IO3	
70	PA11	I/O	USB_OTG_FS_DM	
71	PA12	I/O	USB_OTG_FS_DP	
72	PA13 (JTMS/SWDIO)	I/O	DEBUG_JTMS-SWDIO	
73	VCAP	Power		
74	VSS	Power		
75	VDD	Power		
76	PA14 (JTCK/SWCLK)	I/O	DEBUG_JTCK-SWCLK	
92	PB6	I/O	QUADSPI_BK1_NCS	
94	BOOT0	Boot		
99	VSS	Power		
100	VDD	Power		

<sup>\*</sup> The pin is affected with an I/O function

# 4. Clock Tree Configuration



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# 1. Power Consumption Calculator report

### 1.1. Microcontroller Selection

Series	STM32H7
Line	STM32H743/753
MCU	STM32H743VITx
Datasheet	DS12110_Rev8

### 1.2. Parameter Selection

Temperature	25
Vdd	3.0

## 1.3. Battery Selection

Battery	Alkaline(9V)	
Capacity	625.0 mAh	
Self Discharge	0.3 %/month	
Nominal Voltage	9.0 V	
Max Cont Current	200.0 mA	
Max Pulse Current	0.0 mA	
Cells in series	1	
Cells in parallel	1	

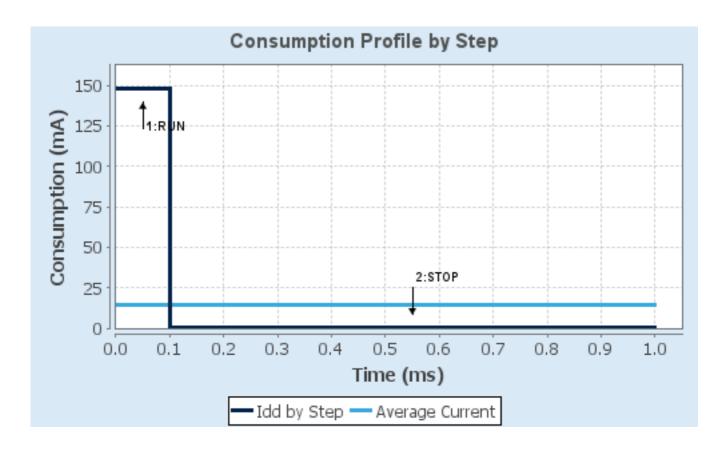
# 1.4. Sequence

		1
Step	Step1	Step2
Mode	RUN	STOP
Vdd	3.0	3.0
Voltage Source	Battery	Battery
Range	VOS0: Scale0-High	SVOS5: System-Scale5
D1 Mode	DRUN/CRUN	DSTANDBY
D2 Mode	DRUN	DSTANDBY
D3 Mode	DRUN	DSTOP
Fetch Type	ITCM	NA
CPU Frequency	480 MHz	0 Hz
Clock Configuration	HSE BYP PLL	Flash-OFF
Clock Source Frequency	24 MHz	0 Hz
Peripherals		
Additional Cons.	0 mA	0 mA
Average Current	148 mA	150 μΑ
Duration	0.1 ms	0.9 ms
DMIPS	1027.0	0.0
Ta Max	105.02	124.98
Category	In DS Table	In DS Table

### 1.5. Results

Sequence Time	1 ms	Average Current	14.94 mA
Battery Life	1 day, 17 hours	Average DMIPS	1027.2001
	-	-	DMIPS

### 1.6. Chart



# 2. Software Project

## 2.1. Project Settings

Name	Value
Project Name	DevEBox
Project Folder	C:\Users\Butch\STM32CubelDE\workspace_1.17.0\DevEBox
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_H7 V1.12.1
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	Yes
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	MX_GPIO_Init	GPIO
2	SystemClock_Config	RCC
3	MX_BDMA_Init	BDMA
4	MX_QUADSPI_Init	QUADSPI
5	MX_USB_DEVICE_Init	USB_DEVICE
6	MX_ADC3_Init	ADC3

# 3. Peripherals and Middlewares Configuration

#### 3.1. ADC3

#### mode: Temperature Sensor Channel

#### 3.1.1. Parameter Settings:

ADC\_Settings:

Clock Prescaler Asynchronous clock mode divided by 1

Resolution ADC 16-bit resolution

Scan Conversion Mode

Continuous Conversion Mode

Disabled \*

Discontinuous Conversion Mode

Disabled \*

End Of Conversion Selection End of single conversion

Overrun behaviour Overrun data preserved

Left Bit Shift No bit shift

Conversion Data Management Mode Regular Conversion data stored in DR register only

Low Power Auto Wait Disabled

ADC\_Regular\_ConversionMode:

Enable Regular ConversionsEnableEnable Regular OversamplingDisableOversampling Ratio1Number Of Conversion1

External Trigger Conversion Source Regular Conversion launched by software

External Trigger Conversion Edge None Rank 1

Channel Channel Temperature Sensor

Sampling Time 1.5 Cycles
Offset Number No offset
Offset Signed Saturation Disable

ADC\_Injected\_ConversionMode:

Enable Injected Conversions Disable

**Analog Watchdog 1:** 

Enable Analog WatchDog1 Mode false

**Analog Watchdog 2:** 

Enable Analog WatchDog2 Mode false

**Analog Watchdog 3:** 

Enable Analog WatchDog3 Mode false

#### **3.2. DEBUG**

**Debug: Serial Wire** 

#### 3.3. MEMORYMAP

mode: Activated

#### 3.4. QUADSPI

QuadSPI Mode: Bank1 with Quad SPI Lines

#### 3.4.1. Parameter Settings:

#### **General Parameters:**

Clock Prescaler 2 \*
Fifo Threshold 4 \*

Sample Shifting No Sample Shifting

Flash Size 22 \*

Device Type Not defined
Chip Select High Time 1 Cycle
Clock Mode Low
Flash ID Flash ID 1
Dual Flash Disabled

#### 3.5. RCC

#### High Speed Clock (HSE): Crystal/Ceramic Resonator

#### 3.5.1. Parameter Settings:

#### **Power Parameters:**

SupplySource PWR\_LDO\_SUPPLY

Power Regulator Voltage Scale Power Regulator Voltage Scale 1

**RCC Parameters:** 

TIM Prescaler Selection Disabled
HSE Startup Timout Value (ms) 100
LSE Startup Timout Value (ms) 5000
CSI Calibration Value 32
HSI Calibration Value 64

**System Parameters:** 

VDD voltage (V) 3.3

Flash Latency(WS) 2 WS (3 CPU cycle)

Product revision rev.V

**PLL range Parameters:** 

PLL1 clock Input range

PLL2 input frequency range

Between 1 and 2 MHz

PLL3 input frequency range

Between 1 and 2 MHz

PLL1 clock Output range

PLL2 clock Output range

Wide VCO range

PLL3 clock Output range

Wide VCO range

Wide VCO range

#### 3.6. SYS

**Timebase Source: TIM1** 

#### 3.7. USB OTG FS

Mode: Device\_Only

### 3.7.1. Parameter Settings:

Speed Full Speed 12MBit/s

Enable internal IP DMA Disabled
Low power Disabled
Battery charging Disabled
Link Power Management Disabled
Use dedicated end point 1 interrupt Disabled
VBUS sensing Disabled
Signal start of frame Disabled

#### 3.8. USB\_DEVICE

#### Class For FS IP: Communication Device Class (Virtual Port Com)

#### 3.8.1. 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\_SELF\_POWERED (Enabled self power) Enabled

USBD\_DEBUG\_LEVEL (USBD Debug Level) 0: No debug message

USBD\_LPM\_ENABLED (Link Power Management) 1: Link Power Management supported

#### **Class Parameters:**

USB CDC Rx Buffer Size 2048
USB CDC Tx Buffer Size 2048

#### 3.8.2. 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) 22336

PRODUCT\_STRING (Product Identifier) STM32 Virtual ComPort

CONFIGURATION\_STRING (Configuration Identifier)

INTERFACE\_STRING (Interface Identifier)

CDC Interface

CDC Interface

<sup>\*</sup> User modified value

# 4. System Configuration

# 4.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
DEBUG	PA13 (JTMS/SWDI O)	DEBUG_JTMS- SWDIO	n/a	n/a	n/a	
	PA14 (JTCK/SWC LK)	DEBUG_JTCK- SWCLK	n/a	n/a	n/a	
QUADSPI	PE2	QUADSPI_BK1_I O2	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PB2	QUADSPI_CLK	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PD11	QUADSPI_BK1_I O0	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PD12	QUADSPI_BK1_I O1	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PD13	QUADSPI_BK1_I O3	Alternate Function Push Pull	No pull-up and no pull-down	Very High	
	PB6	QUADSPI_BK1_ NCS	Alternate Function Push Pull	Pull-up *	Very High	
RCC	PH0- OSC_IN (PH0)	RCC_OSC_IN	n/a	n/a	n/a	
	PH1- OSC_OUT (PH1)	RCC_OSC_OUT	n/a	n/a	n/a	
USB_OTG_ FS	PA11	USB_OTG_FS_ DM	Alternate Function Push Pull	No pull-up and no pull-down	Low	
	PA12	USB_OTG_FS_ DP	Alternate Function Push Pull	No pull-up and no pull-down	Low	
GPIO	PA1	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. BDMA configuration

DMA request	Stream	Direction	Priority
ADC3	BDMA_Channel0	Peripheral To Memory	Low

### ADC3: BDMA\_Channel0 DMA request Settings:

Mode: Circular \*

Peripheral Increment: Disable

Memory Increment: Enable \*

Peripheral Data Width: Half Word

Memory Data Width: Half Word

## 4.4. MDMA configuration

nothing configured in DMA service

# 4.5. NVIC configuration

# 4.5.1. 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	
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	0	0	
TIM1 update interrupt	true	15	0	
USB On The Go FS global interrupt	true	0	0	
DMAMUX2 overrun interrupt	true	0	0	
BDMA channel0 global interrupt	true	0	0	
PVD and AVD interrupts through EXTI line 16	unused			
Flash global interrupt	unused			
RCC global interrupt	unused			
FPU global interrupt	unused			
QUADSPI global interrupt	unused			
USB On The Go FS End Point 1 Out global interrupt	unused			
USB On The Go FS End Point 1 In global interrupt	unused			
HSEM1 global interrupt	unused			
ADC3 global interrupt	unused			

## 4.5.2. 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
Pre-fetch 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
System tick timer	false	true	true

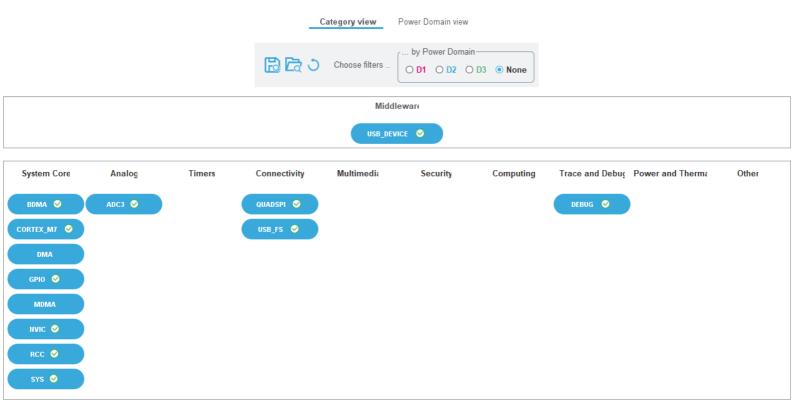
Enabled interrupt Table	Select for init	Generate IRQ	Call HAL handler
	sequence ordering	handler	
TIM1 update interrupt	false	true	true
USB On The Go FS global interrupt	false	true	true
DMAMUX2 overrun interrupt	false	true	true
BDMA channel0 global interrupt	false	true	true

<sup>\*</sup> User modified value

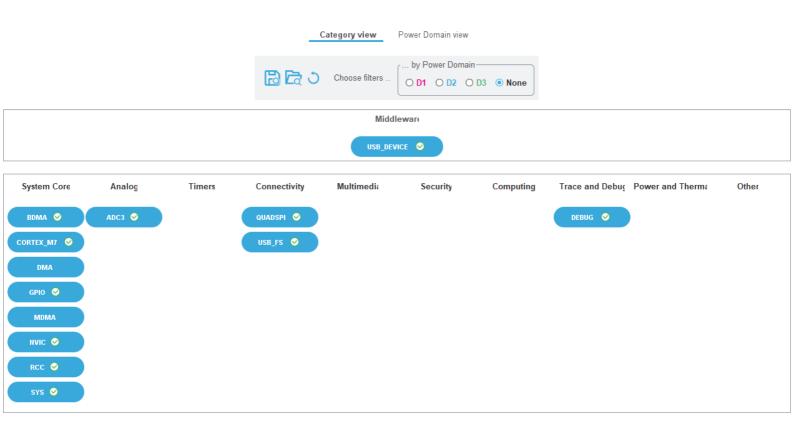
# 5. System Views

5.1. Category view

5.1.1. Current



## 5.1.2. Without filters



### 5.2. Power Domain view



Power Domain view

# 6. Docs & Resources

Type Link

BSDL files https://www.st.com/resource/en/bsdl\_model/stm32h7\_bsdl.zip

IBIS models https://www.st.com/resource/en/ibis\_model/stm32h7\_ibis.zip

System View https://www.st.com/resource/en/svd/stm32h7-svd.zip

Description

Presentations https://www.st.com/resource/en/product\_presentation/microcontrollers\_st

m32h7\_series\_product\_overview.pdf

Presentations https://www.st.com/resource/en/product\_presentation/stm32-

stm8\_embedded\_software\_solutions.pdf

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stm32-family-overview.pdf

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stm32h7rs-lines-overview.pdf

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and-smart-i-os.pdf

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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-solderingrecommendations-and-package-information-for-leadfree-ecopack-mcusand-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
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- Application Notes https://www.st.com/resource/en/application\_note/an4936-migration-of-microcontroller-applications-from-stm32f7-series-to-stm32h743753-line-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application\_note/an4989-stm32-microcontroller-debug-toolbox-stmicroelectronics.pdf
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- Application Notes https://www.st.com/resource/en/application\_note/an5354-getting-started-with-the-stm32h7-series-mcu-16bit-adc-stmicroelectronics.pdf
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