



## 1. Description

### 1.1. Project

Project Name	ElbAltm
Board Name	custom
Generated with:	STM32CubeMX 6.13.0
Date	02/12/2025

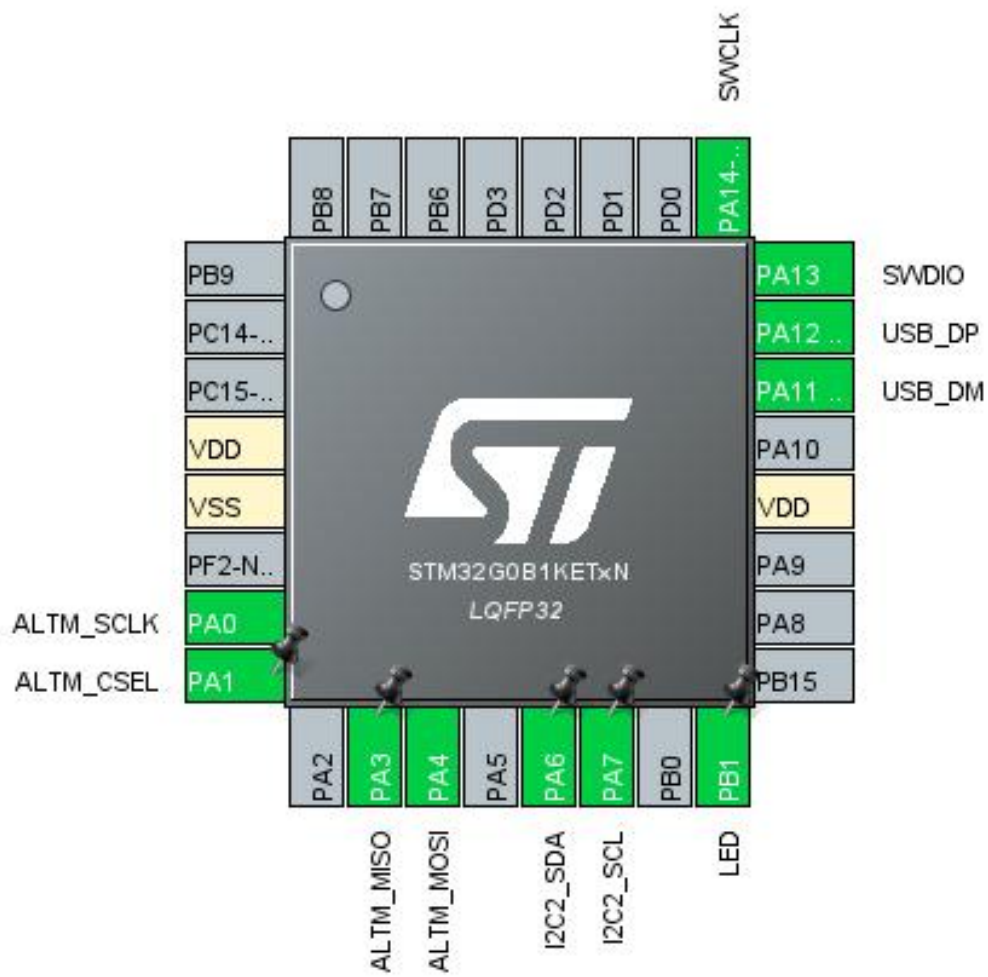
### 1.2. MCU

MCU Series	STM32G0
MCU Line	STM32G0x1
MCU name	STM32G0B1KETxN
MCU Package	LQFP32
MCU Pin number	32

### 1.3. Core(s) information

Core(s)	ARM Cortex-M0+
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## 2. Pinout Configuration

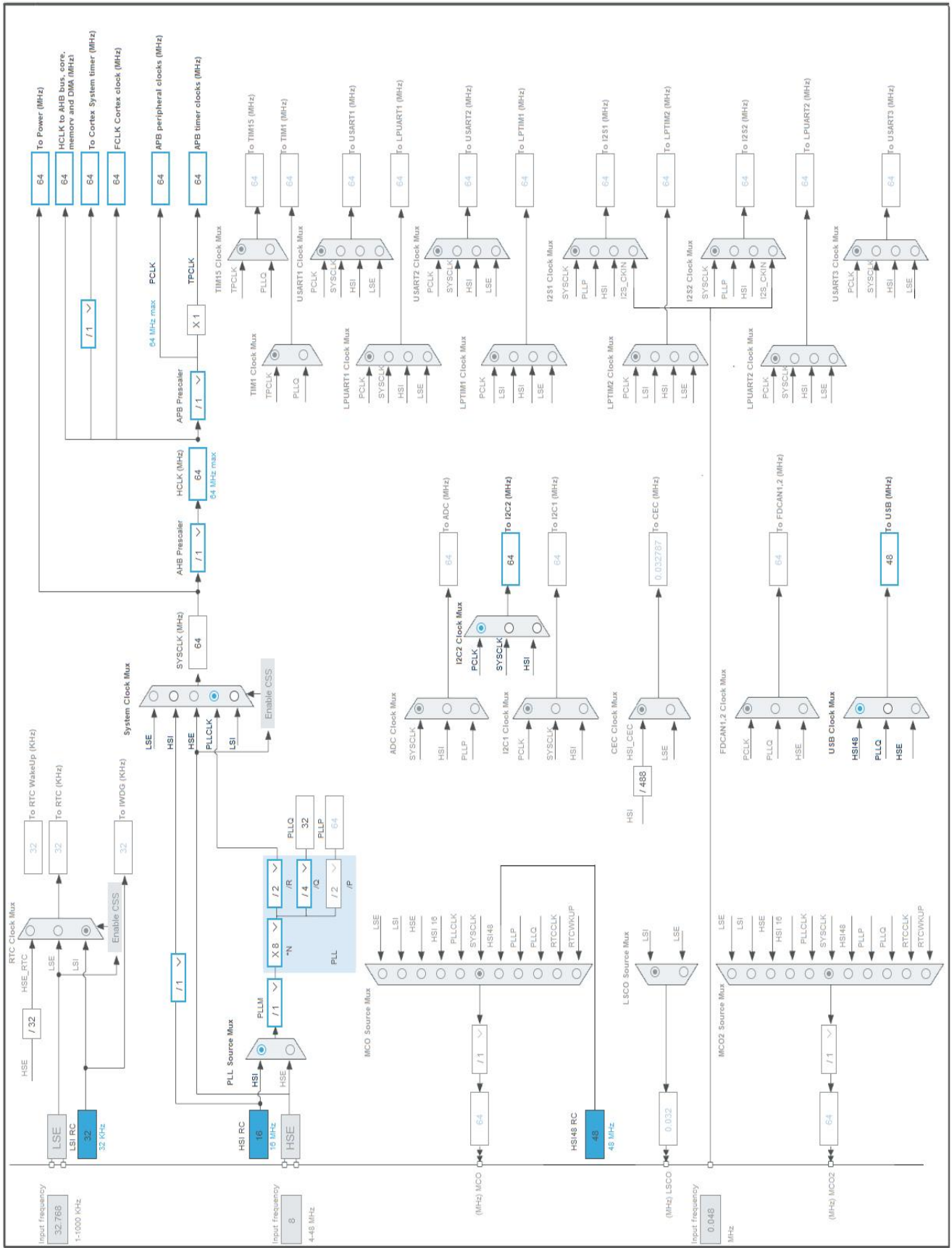


### 3. Pins Configuration

Pin Number LQFP32	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
4	VDD	Power		
5	VSS	Power		
7	PA0	I/O	SPI2_SCK	ALTM_SCLK
8	PA1 *	I/O	GPIO_Output	ALTM_CSEL
10	PA3	I/O	SPI2_MISO	ALTM_MISO
11	PA4	I/O	SPI2_MOSI	ALTM_MOSI
13	PA6	I/O	I2C2_SDA	
14	PA7	I/O	I2C2_SCL	
16	PB1 *	I/O	GPIO_Output	LED
20	VDD	Power		
22	PA11 [PA9]	I/O	USB_DM	
23	PA12 [PA10]	I/O	USB_DP	
24	PA13	I/O	SYS_SWDIO	SWDIO
25	PA14-BOOT0	I/O	SYS_SWCLK	SWCLK

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

## 4. Clock Tree Configuration



## 1. Power Consumption Calculator report

### 1.1. Microcontroller Selection

Series	STM32G0
Line	STM32G0x1
MCU	STM32G0B1KETxN
Datasheet	DS13560_Rev0

### 1.2. Parameter Selection

Temperature	25
Vdd	3.0

### 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

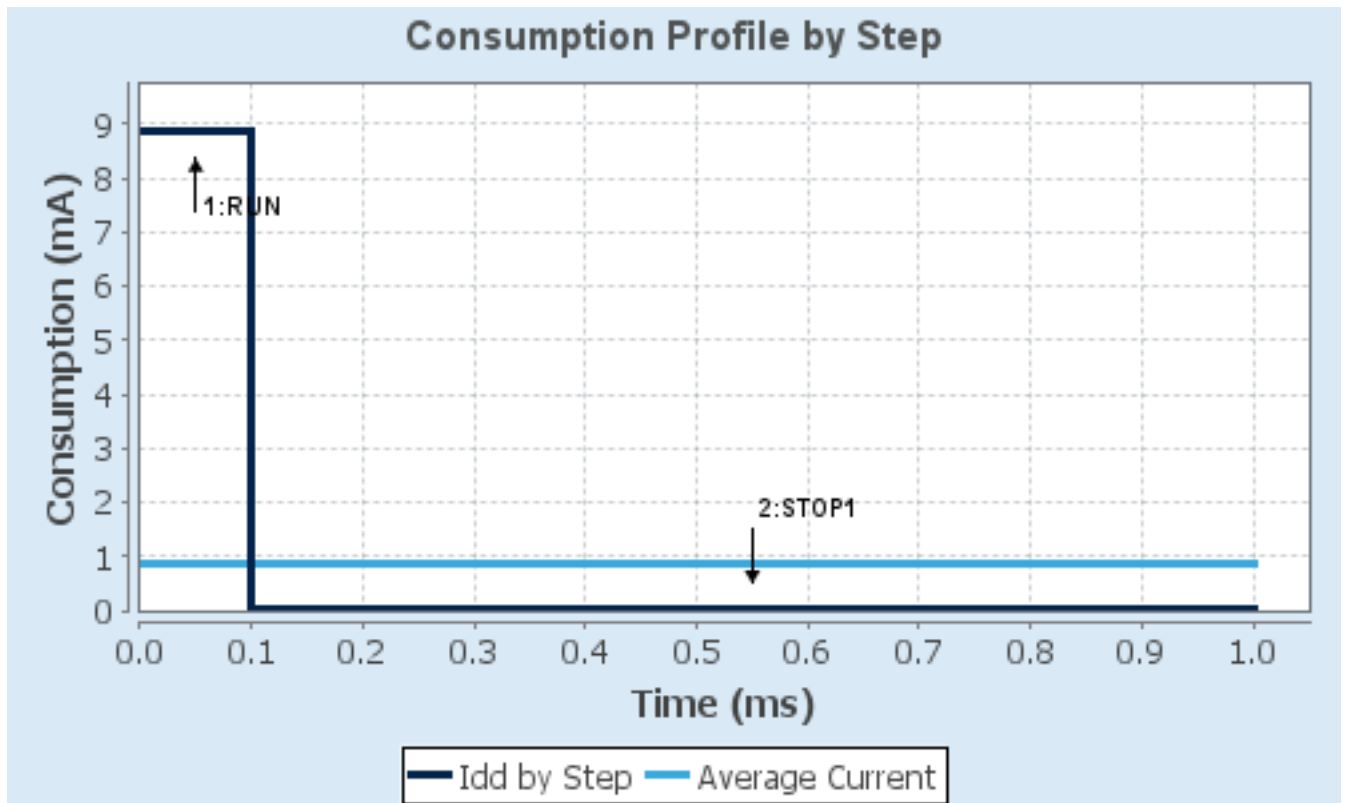
#### 1.4. Sequence

<b>Step</b>	Step1	Step2
<b>Mode</b>	RUN	STOP1
<b>Vdd</b>	3.0	3.0
<b>Voltage Source</b>	Battery	Battery
<b>Range</b>	Range1-High	Range1-High
<b>Fetch Type</b>	SRAM1/Flash-PowerDown/D_SRAM1	Flash-PowerDown/D_SRAM1/Cache
<b>CPU Frequency</b>	64 MHz	16 MHz
<b>Clock Configuration</b>	HSI PLL	HSI
<b>Clock Source Frequency</b>	16 MHz	16 MHz
<b>Peripherals</b>		
<b>Additional Cons.</b>	0 mA	0 mA
<b>Average Current</b>	8.85 mA	7.05 $\mu$ A
<b>Duration</b>	0.1 ms	0.9 ms
<b>DMIPS</b>	80.0	20.0
<b>Ta Max</b>	127.77	130
<b>Category</b>	In DS Table	In DS Table

#### 1.5. Results

Sequence Time	1 ms	Average Current	891.34 $\mu$ A
Battery Life	5 months, 6 days, 4 hours	Average DMIPS	26.0 DMIPS

#### 1.6. Chart





## 2. Software Project

### 2.1. Project Settings

Name	Value
Project Name	ElbAltm
Project Folder	C:\dirpers\Progetti x MCU\ElbALTM\fw_stm32\ElbAltm
Toolchain / IDE	CMake
Firmware Package Name and Version	STM32Cube FW_G0 V1.6.2
Application Structure	Advanced
Generate Under Root	No
Do not generate the main()	No
Minimum Heap Size	0x1000
Minimum Stack Size	0x1000

### 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	Yes

### 2.3. Advanced Settings - Generated Function Calls

Rank	Function Name	Peripheral Instance Name
1	SystemClock_Config	RCC
2	MX_GPIO_Init	GPIO
3	MX_USB_Device_Init	USB_DEVICE
4	MX_SPI2_Init	SPI2
5	MX_I2C2_Init	I2C2

## 3. Peripherals and Middlewares Configuration

### 3.1. I2C2

#### I2C: I2C

##### 3.1.1. Parameter Settings:

##### Timing configuration:

Custom Timing	Disabled
I2C Speed Mode	<b>Fast Mode *</b>
I2C Speed Frequency (KHz)	400
Rise Time (ns)	100
Fall Time (ns)	100
Coefficient of Digital Filter	0
Analog Filter	Enabled
Timing	<b>0x00C12166 *</b>

##### 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

### 3.2. RCC

##### 3.2.1. Parameter Settings:

##### System Parameters:

VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Enabled
Data Cache	Enabled
Flash Latency(WS)	2 WS (3 CPU cycle)

##### RCC Parameters:

HSI Calibration Value	64
HSE Startup Timeout Value (ms)	100
LSE Startup Timeout Value (ms)	5000

##### Power Parameters:

Power Regulator Voltage Scale	Power Regulator Voltage Scale 1
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##### Peripherals Clock Configuration:

Generate the peripherals clock configuration	TRUE
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### 3.3. SPI2

**Mode: Full-Duplex Master**

#### 3.3.1. Parameter Settings:

**Basic Parameters:**

Frame Format	Motorola
Data Size	<b>8 Bits *</b>
First Bit	MSB First

**Clock Parameters:**

Prescaler (for Baud Rate)	<b>4 *</b>
Baud Rate	<b>16.0 MBits/s *</b>
Clock Polarity (CPOL)	Low
Clock Phase (CPHA)	1 Edge

**Advanced Parameters:**

CRC Calculation	Disabled
NSSP Mode	Enabled
NSS Signal Type	Software

### 3.4. SYS

**mode: Debug**

**Timebase Source: SysTick**

**mode: save power of non-active UCPD - deactive Dead Battery pull-up**

### 3.5. USB\_DRD\_FS

**Mode: Device\_Only\_FS**

#### 3.5.1. Parameter Settings:

**Basic Parameters:**

Speed	Full Speed 12MBit/s
Physical interface	Internal Phy
Signal start of frame	Disabled

**Power Parameters:**

Low Power	Disabled
Link Power Management	Disabled
Battery Charging	Disabled

#### EndPoint Parameters:

bulk double buffer	Disabled
iso single buffer	Disabled

### 3.6. USB\_DEVICE

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

##### 3.6.1. 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

##### 3.6.2. Device Descriptor:

#### Device Descriptor:

VID (Vendor Identifier)	1155
LANGID_STRING (Language Identifier)	<b>Italian (Standard) *</b>
MANUFACTURER_STRING (Manufacturer Identifier)	<b>ELB lab *</b>

#### Device Descriptor FS:

PID (Product Identifier)	22336
PRODUCT_STRING (Product Identifier)	<b>LB Con Port *</b>
CONFIGURATION_STRING (Configuration Identifier)	CDC Config
INTERFACE_STRING (Interface Identifier)	CDC Interface

\* User modified value

## 4. System Configuration

### 4.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
I2C2	PA6	I2C2_SDA	Alternate Function Open Drain	<b>Pull-up *</b>	<b>Very High *</b>	
	PA7	I2C2_SCL	Alternate Function Open Drain	<b>Pull-up *</b>	<b>Very High *</b>	
SPI2	PA0	SPI2_SCK	Alternate Function Push Pull	No pull-up and no pull-down	<b>Very High *</b>	ALTM_SCLK
	PA3	SPI2_MISO	Alternate Function Push Pull	No pull-up and no pull-down	<b>Very High *</b>	ALTM_MISO
	PA4	SPI2_MOSI	Alternate Function Push Pull	No pull-up and no pull-down	<b>Very High *</b>	ALTM_MOSI
SYS	PA13	SYS_SWDIO	n/a	n/a	n/a	SWDIO
	PA14-BOOT0	SYS_SWCLK	n/a	n/a	n/a	SWCLK
USB_DRD_FS	PA11 [PA9]	USB_DM	n/a	n/a	n/a	
	PA12 [PA10]	USB_DP	n/a	n/a	n/a	
GPIO	PA1	GPIO_Output	Output Push Pull	No pull-up and no pull-down	<b>Very High *</b>	ALTM_CSEL
	PB1	GPIO_Output	<b>Output Open Drain *</b>	No pull-up and no pull-down	<b>Medium *</b>	LED

### 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 SWI instruction	true	0	0
Pendable request for system service	true	0	0
System tick timer	true	1	0
USB, UCPD1 and UCPD2 global interrupts	true	2	0
PVD through EXTI line 16, PVM (monit. VDDIO2) through EXTI line 34	unused		
Flash global interrupt	unused		
RCC global Interrupt	unused		
I2C2, I2C3 Interrupt (combined with EXTI 24 and EXTI 22)	unused		
SPI2/I2S2, SPI3/I2S3 Interrupt	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	true	false
Hard fault interrupt	false	true	false
System service call via SWI instruction	false	true	false
Pendable request for system service	false	true	false
System tick timer	false	true	true
USB, UCPD1 and UCPD2 global interrupts	false	true	true

\* User modified value

## 5. System Views

### 5.1. Category view

#### 5.1.1. Current

#### Middleware

USB\_DEVICE ✓

#### System Core

DMA

GPIO ✓

NVIC ✓

RCC ✓

SYS ✓

#### Analog

#### Timers

#### Connectivity

I2C2 ✓

SPI2 ✓

USB\_DRD\_FS ✓

#### Multimedia

#### Computing

#### Utilities

## 6. Docs & Resources

Type	Link
IBIS models	<a href="https://www.st.com/resource/en/ibis_model/stm32g0_ibis.zip">https://www.st.com/resource/en/ibis_model/stm32g0_ibis.zip</a>
System View Description	<a href="https://www.st.com/resource/en/svd/stm32g0-svd.zip">https://www.st.com/resource/en/svd/stm32g0-svd.zip</a>
Presentations	<a href="https://www.st.com/resource/en/product_presentation/stm32-stm8_embedded_software_solutions.pdf">https://www.st.com/resource/en/product_presentation/stm32-stm8_embedded_software_solutions.pdf</a>
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Presentations	<a href="https://www.st.com/resource/en/product_presentation/microcontrollers-stm32-entry-level-graphics.pdf">https://www.st.com/resource/en/product_presentation/microcontrollers-stm32-entry-level-graphics.pdf</a>
Brochures	<a href="https://www.st.com/resource/en/brochure/products-and-solutions-for-plcs-and-smart-i-os.pdf">https://www.st.com/resource/en/brochure/products-and-solutions-for-plcs-and-smart-i-os.pdf</a>
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Application Notes	<a href="https://www.st.com/resource/en/application_note/an1709-emc-design-guide-for-stm8-stm32-and-legacy-mcus-stmicroelectronics.pdf">https://www.st.com/resource/en/application_note/an1709-emc-design-guide-for-stm8-stm32-and-legacy-mcus-stmicroelectronics.pdf</a>
Application Notes	<a href="https://www.st.com/resource/en/application_note/an2606-stm32-">https://www.st.com/resource/en/application_note/an2606-stm32-</a>



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Application Notes [https://www.st.com/resource/en/application\\_note/an4655-virtually-increasing-the-number-of-serial-communication-peripherals-in-stm32-applications-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an4655-virtually-increasing-the-number-of-serial-communication-peripherals-in-stm32-applications-stmicroelectronics.pdf)

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