



## 1. Description

### 1.1. Project

Project Name	Cube_PWM_TO_DAC
Board Name	custom
Generated with:	STM32CubeMX 6.13.0
Date	12/19/2024

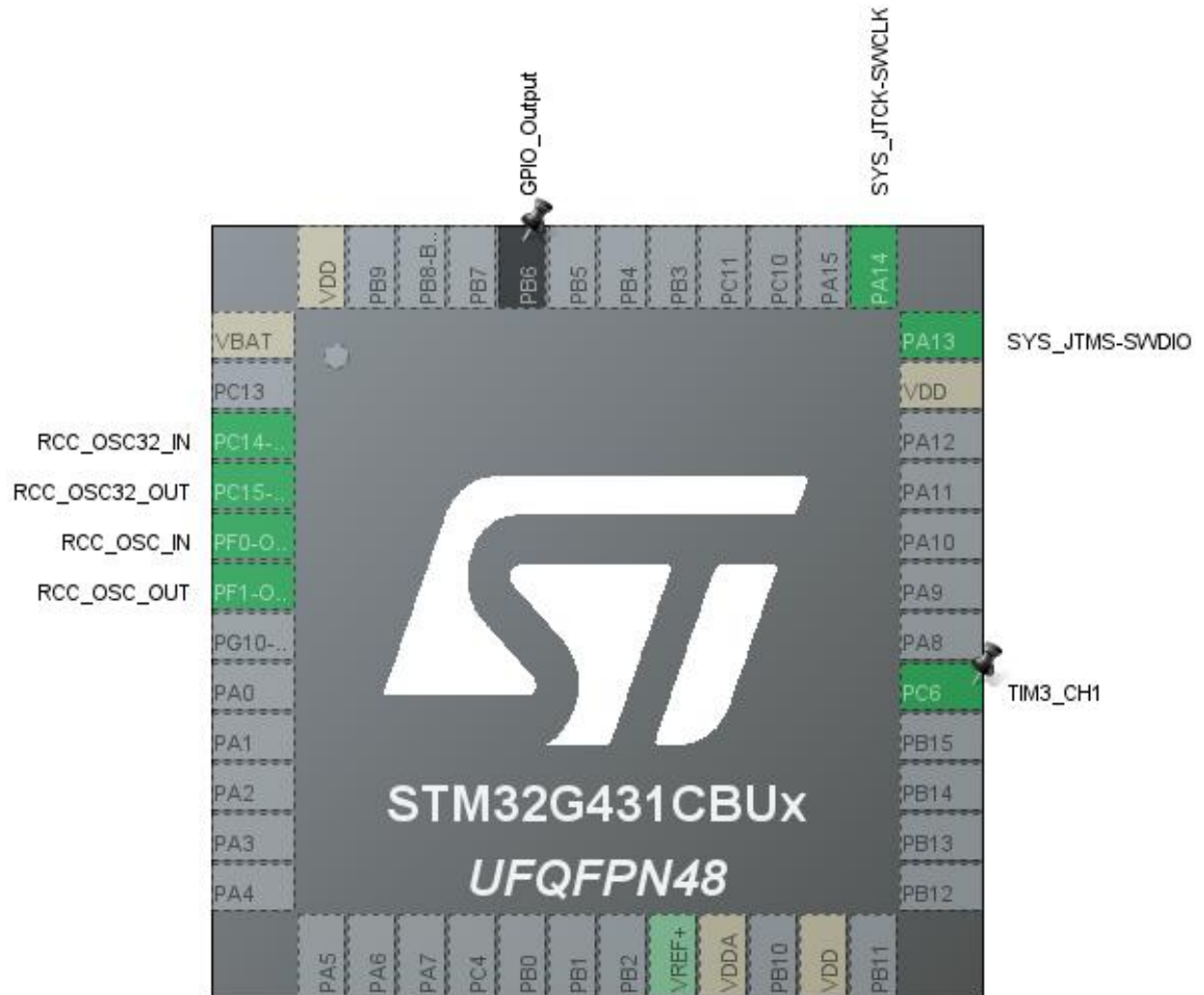
### 1.2. MCU

MCU Series	STM32G4
MCU Line	STM32G4x1
MCU name	STM32G431CBUx
MCU Package	UFQFPN48
MCU Pin number	48

### 1.3. Core(s) information

Core(s)	ARM Cortex-M4
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## 2. Pinout Configuration

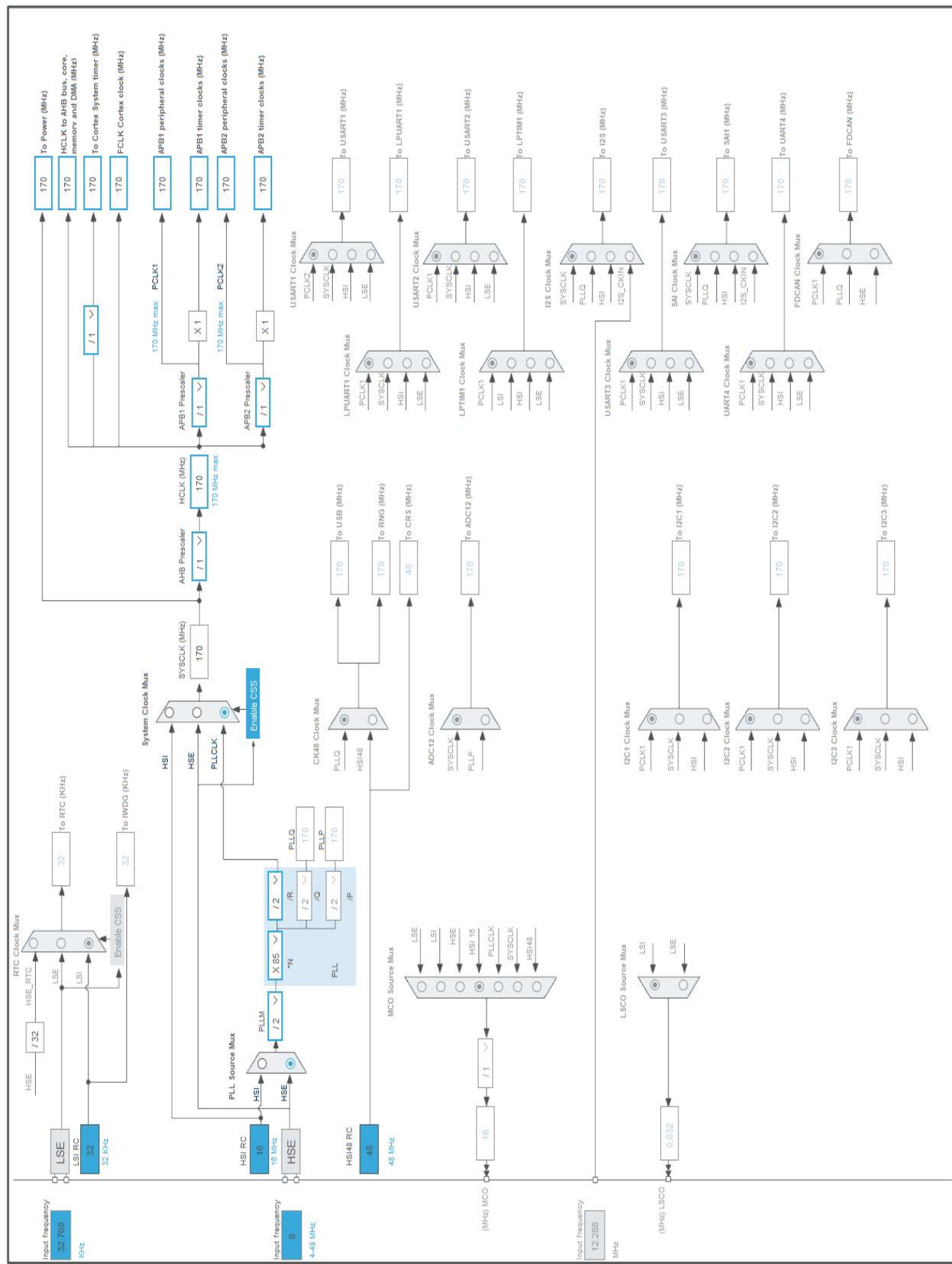


### 3. Pins Configuration

Pin Number UFQFPN48	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
3	PC14-OSC32_IN	I/O	RCC_OSC32_IN	
4	PC15-OSC32_OUT	I/O	RCC_OSC32_OUT	
5	PF0-OSC_IN	I/O	RCC_OSC_IN	
6	PF1-OSC_OUT	I/O	RCC_OSC_OUT	
21	VDDA	Power		
23	VDD	Power		
29	PC6	I/O	TIM3_CH1	
35	VDD	Power		
36	PA13	I/O	SYS_JTMS-SWDIO	
37	PA14	I/O	SYS_JTCK-SWCLK	
44	PB6 *	I/O	GPIO_Output	
48	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	STM32G4
Line	STM32G4x1
MCU	STM32G431CBUx
Datasheet	DS12589_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

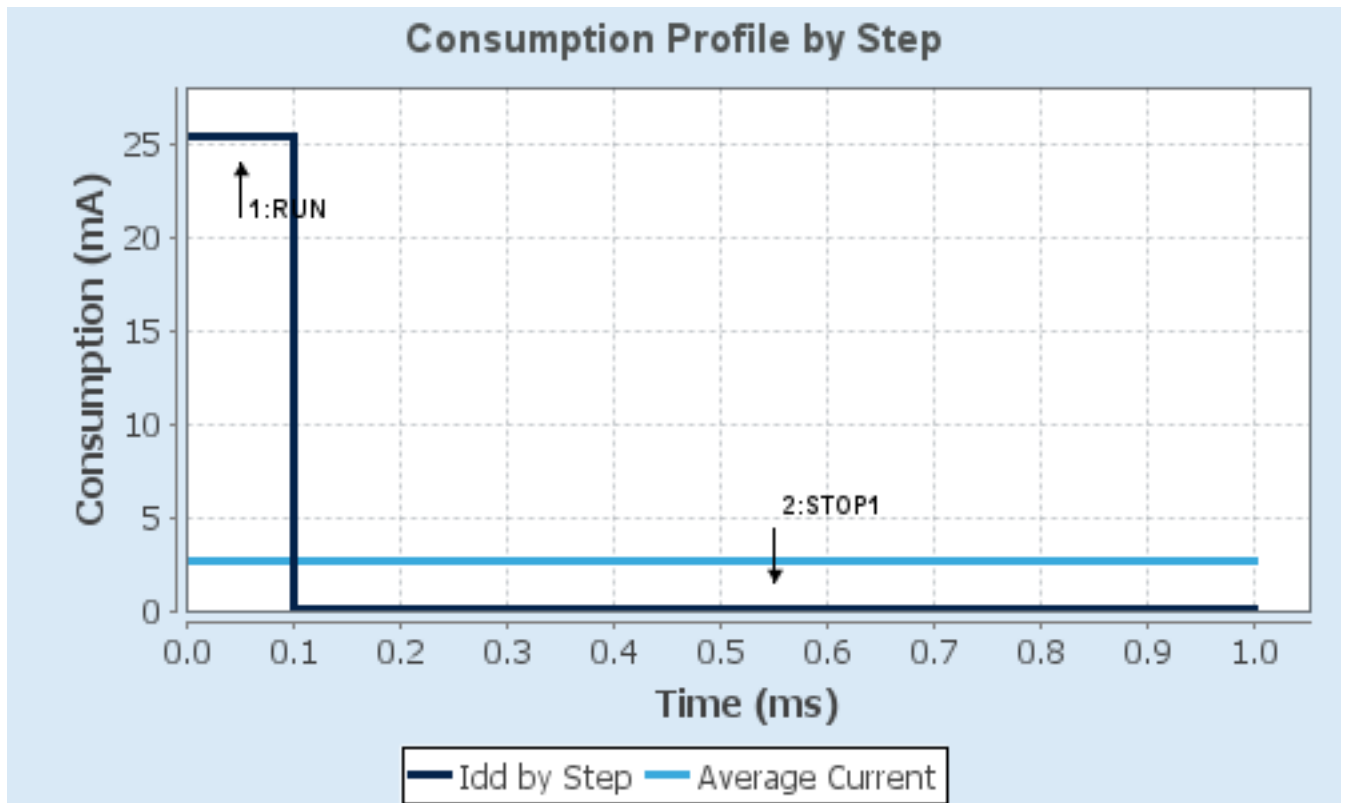
#### 1.4. Sequence

<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-Boost	NoRange
<b>Fetch Type</b>	FLASH/ART	NA
<b>CPU Frequency</b>	170 MHz	0 Hz
<b>Clock Configuration</b>	HSE BYP PLL	ALL CLOCKS OFF
<b>Clock Source Frequency</b>	4 MHz	0 Hz
<b>Peripherals</b>		
<b>Additional Cons.</b>	0 mA	0 mA
<b>Average Current</b>	25.5 mA	59 $\mu$ A
<b>Duration</b>	0.1 ms	0.9 ms
<b>DMIPS</b>	213.0	0.0
<b>Ta Max</b>	127.71	129.99
<b>Category</b>	In DS Table	In DS Table

#### 1.5. Results

Sequence Time	1 ms	Average Current	2.6 mA
Battery Life	1 month, 23 days, 22 hours	Average DMIPS	212.5 DMIPS

#### 1.6. Chart





## 2. Software Project

### 2.1. Project Settings

Name	Value
Project Name	Cube_PWM_TO_DAC
Project Folder	C:\fw\stm32\stm32g431\Cube_PWM_TO_DAC
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_G4 V1.6.1
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	SystemClock_Config	RCC
2	MX_GPIO_Init	GPIO
3	MX_DMA_Init	DMA
4	MX_TIM4_Init	TIM4
5	MX_TIM3_Init	TIM3

### 3. Peripherals and Middlewares Configuration

#### 3.1. RCC

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

**Low Speed Clock (LSE) : Crystal/Ceramic Resonator**

##### 3.1.1. Parameter Settings:

###### **System Parameters:**

VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Disabled
Data Cache	Enabled
Flash Latency(WS)	4 WS (5 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 boost
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###### **Peripherals Clock Configuration:**

Generate the peripherals clock configuration	TRUE
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#### 3.2. SYS

**Debug: Serial Wire**

**Timebase Source: SysTick**

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

#### 3.3. TIM3

**Clock Source : Internal Clock**

**Channel1: PWM Generation CH1**

##### 3.3.1. Parameter Settings:

###### **Counter Settings:**

Prescaler (PSC - 16 bits value)	0
Counter Mode	Up
Dithering	Disable
Counter Period (AutoReload Register - 16 bits value )	<b>1024-1 *</b>
Internal Clock Division (CKD)	No Division

auto-reload preload **Enable \***

**Trigger Output (TRGO) Parameters:**

Master/Slave Mode (MSM bit) Disable (Trigger input effect not delayed)  
Trigger Event Selection TRGO Reset (UG bit from TIMx\_EGR)

**Clear Input:**

Clear Input Source Disable

**PWM Generation Channel 1:**

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

### 3.4. TIM4

**Clock Source : Internal Clock**

**Channel1: Output Compare No Output**

#### 3.4.1. Parameter Settings:

**Counter Settings:**

Prescaler (PSC - 16 bits value) 0  
Counter Mode Up  
Dithering Disable  
Counter Period (AutoReload Register - 16 bits value ) **100 \***  
Internal Clock Division (CKD) No Division  
auto-reload preload **Enable \***

**Trigger Output (TRGO) Parameters:**

Master/Slave Mode (MSM bit) Disable (Trigger input effect not delayed)  
Trigger Event Selection TRGO Reset (UG bit from TIMx\_EGR)

**Clear Input:**

Clear Input Source Disable

**Output Compare No Output Channel 1:**

Mode Frozen (used for Timing base)  
Pulse (16 bits value) 0  
Output compare preload Disable  
CH Polarity High

**\* User modified value**

## 4. System Configuration

### 4.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
RCC	PC14-OSC32_IN	RCC_OSC32_IN	n/a	n/a	n/a	
	PC15-OSC32_OUT	RCC_OSC32_OUT	n/a	n/a	n/a	
	PF0-OSC_IN	RCC_OSC_IN	n/a	n/a	n/a	
	PF1-OSC_OUT	RCC_OSC_OUT	n/a	n/a	n/a	
SYS	PA13	SYS_JTMS-SWDIO	n/a	n/a	n/a	
	PA14	SYS_JTCK-SWCLK	n/a	n/a	n/a	
TIM3	PC6	TIM3_CH1	Alternate Function Push Pull	No pull-up and no pull-down	Low	
GPIO	PB6	GPIO_Output	Output Push Pull	<b>Pull-up *</b>	Low	

## 4.2. DMA configuration

DMA request	Stream	Direction	Priority
TIM4_CH1	DMA1_Channel1	Memory To Peripheral	<b>High *</b>

### TIM4\_CH1: DMA1\_Channel1 DMA request Settings:

Mode: **Circular \***  
Peripheral Increment: Disable  
Memory Increment: **Enable \***  
Peripheral Data Width: **Word \***  
Memory Data Width: **Word \***

### 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
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
DMA1 channel1 global interrupt	true	0	0
PVD/PVM1/PVM2/PVM3/PVM4 interrupts through EXTI lines 16/38/39/40/41	unused		
Flash global interrupt	unused		
RCC global interrupt	unused		
TIM3 global interrupt	unused		
TIM4 global interrupt	unused		
FPU global 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
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
DMA1 channel1 global interrupt	false	true	true

\* User modified value

## 5. System Views

### 5.1. Category view

#### 5.1.1. Current

Middleware							
System Core	Analog	Timers	Connectivity	Multimedia	Security	Computing	Utilities
DMA ✓		TIM3 ✓					
GPIO ✓		TIM4 ✓					
NVIC ✓							
RCC ✓							
SYS ✓							



## 6. Docs & Resources

Type	Link
BSDL files	<a href="https://www.st.com/resource/en/bsdl_model/stm32g4_bsd.zip">https://www.st.com/resource/en/bsdl_model/stm32g4_bsd.zip</a>
IBIS models	<a href="https://www.st.com/resource/en/ibis_model/stm32g4_ibis.zip">https://www.st.com/resource/en/ibis_model/stm32g4_ibis.zip</a>
System View Description	<a href="https://www.st.com/resource/en/svd/stm32g4_svd.zip">https://www.st.com/resource/en/svd/stm32g4_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>
Presentations	<a href="https://www.st.com/resource/en/product_presentation/stm32_eval_tools_portfolio.pdf">https://www.st.com/resource/en/product_presentation/stm32_eval_tools_portfolio.pdf</a>
Presentations	<a href="https://www.st.com/resource/en/product_presentation/stm32_stm8_functional-safety-packages.pdf">https://www.st.com/resource/en/product_presentation/stm32_stm8_functional-safety-packages.pdf</a>
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Presentations	<a href="https://www.st.com/resource/en/product_presentation/microcontrollers-stm32-family-overview.pdf">https://www.st.com/resource/en/product_presentation/microcontrollers-stm32-family-overview.pdf</a>
Presentations	<a href="https://www.st.com/resource/en/product_presentation/microcontrollers-stm32g4-series-product-overview.pdf">https://www.st.com/resource/en/product_presentation/microcontrollers-stm32g4-series-product-overview.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>
Flyers	<a href="https://www.st.com/resource/en/flyer/flstm32g4.pdf">https://www.st.com/resource/en/flyer/flstm32g4.pdf</a>
Flyers	<a href="https://www.st.com/resource/en/flyer/flstm32nucleo.pdf">https://www.st.com/resource/en/flyer/flstm32nucleo.pdf</a>
Flyers	<a href="https://www.st.com/resource/en/flyer/flstm32trust.pdf">https://www.st.com/resource/en/flyer/flstm32trust.pdf</a>
Flyers	<a href="https://www.st.com/resource/en/flyer/flstpfc11120.pdf">https://www.st.com/resource/en/flyer/flstpfc11120.pdf</a>
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-microcontroller-system-memory-boot-mode-stmicroelectronics.pdf">https://www.st.com/resource/en/application_note/an2606-stm32-microcontroller-system-memory-boot-mode-stmicroelectronics.pdf</a>
Application Notes	<a href="https://www.st.com/resource/en/application_note/an2639-soldering-">https://www.st.com/resource/en/application_note/an2639-soldering-</a>

recommendations-and-package-information-for-leadfree-ecopack-mcus-and-mpus-stmicroelectronics.pdf

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