



STM32 CubeMX

1. Description

1.1. Project

Project Name	Button-NonBlocking-Advance
Board Name	custom
Generated with:	STM32CubeMX 6.9.2
Date	11/10/2023

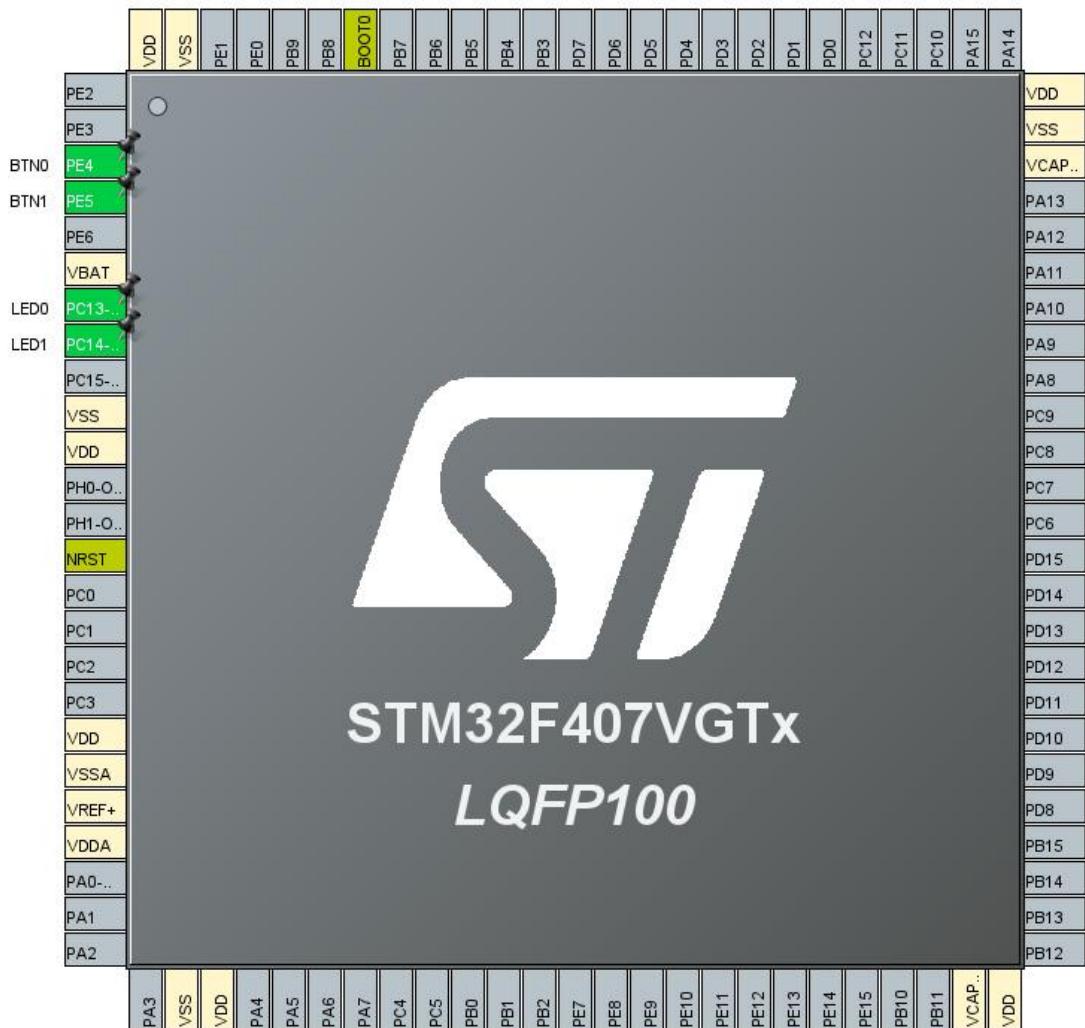
1.2. MCU

MCU Series	STM32F4
MCU Line	STM32F407/417
MCU name	STM32F407VGTx
MCU Package	LQFP100
MCU Pin number	100

1.3. Core(s) information

Core(s)	Arm Cortex-M4
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2. Pinout Configuration

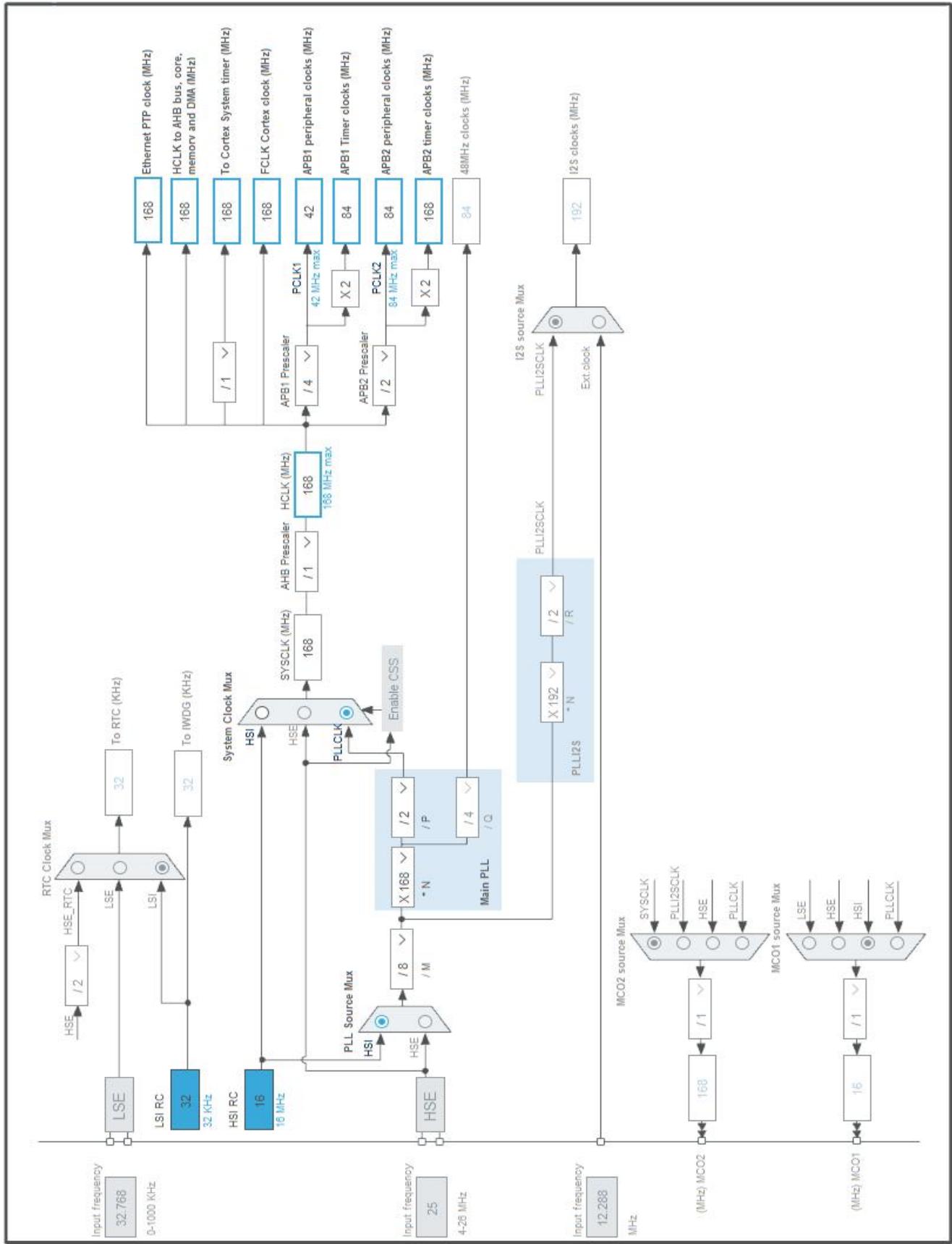


3. Pins Configuration

Pin Number LQFP100	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
3	PE4 *	I/O	GPIO_Input	BTN0
4	PE5 *	I/O	GPIO_Input	BTN1
6	VBAT	Power		
7	PC13-ANTI_TAMP *	I/O	GPIO_Output	LED0
8	PC14-OSC32_IN *	I/O	GPIO_Output	LED1
10	VSS	Power		
11	VDD	Power		
14	NRST	Reset		
19	VDD	Power		
20	VSSA	Power		
21	VREF+	Power		
22	VDDA	Power		
27	VSS	Power		
28	VDD	Power		
49	VCAP_1	Power		
50	VDD	Power		
73	VCAP_2	Power		
74	VSS	Power		
75	VDD	Power		
94	BOOT0	Boot		
99	VSS	Power		
100	VDD	Power		

* The pin is affected with an I/O function

4. Clock Tree Configuration



5. Software Project

5.1. Project Settings

Name	Value
Project Name	Button-NonBlocking-Advance
Project Folder	C:\Users\PA\Desktop\STM32-Examples\STM32F4-Examples\STM32F4-GPIO-
Toolchain / IDE	MDK-ARM V5.27
Firmware Package Name and Version	STM32Cube FW_F4 V1.27.1
Application Structure	Advanced
Generate Under Root	No
Do not generate the main()	No
Minimum Heap Size	0x200
Minimum Stack Size	0x400

5.2. 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

5.3. Advanced Settings - Generated Function Calls

Rank	Function Name	Peripheral Instance Name
1	MX_GPIO_Init	GPIO
2	SystemClock_Config	RCC

1. Power Consumption Calculator report

1.1. Microcontroller Selection

Series	STM32F4
Line	STM32F407/417
MCU	STM32F407VGTx
Datasheet	DS8626_Rev8

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

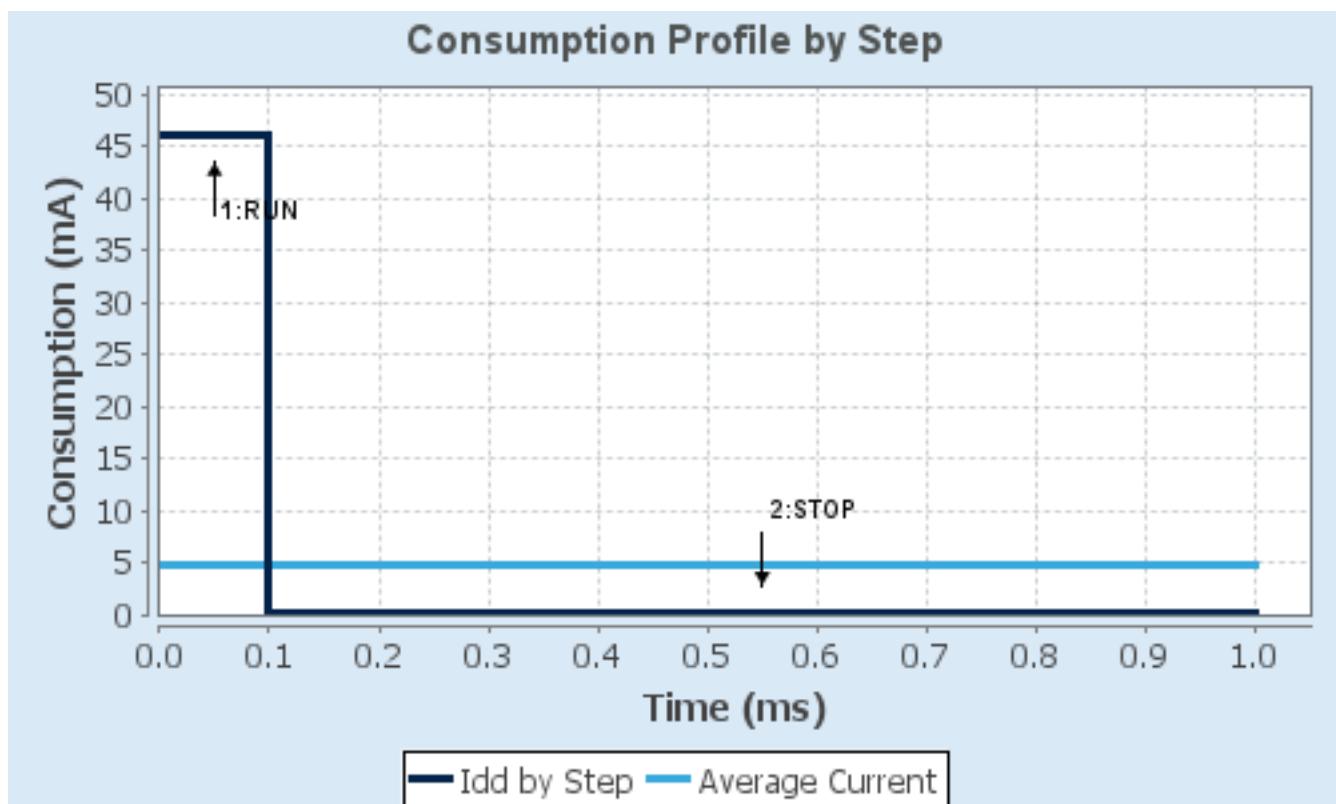
1.4. Sequence

Step	Step1	Step2
Mode	RUN	STOP
Vdd	3.3	3.3
Voltage Source	Battery	Battery
Range	Scale1-High	No Scale
Fetch Type	FLASH	n/a
CPU Frequency	168 MHz	0 Hz
Clock Configuration	HSE PLL	Regulator LP Flash-PwrDwn
Clock Source Frequency	4 MHz	0 Hz
Peripherals		
Additional Cons.	0 mA	0 mA
Average Current	46 mA	280 µA
Duration	0.1 ms	0.9 ms
DMIPS	210.0	0.0
T_a Max	98.47	104.96
Category	In DS Table	In DS Table

1.5. Results

Sequence Time	1 ms	Average Current	4.85 mA
Battery Life	29 days, 4 hours	Average DMIPS	210.0 DMIPS

1.6. Chart



2. Peripherals and Middlewares Configuration

2.1. RCC

2.1.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Enabled
Data Cache	Enabled
Flash Latency(WS)	5 WS (6 CPU cycle)

RCC Parameters:

HSI Calibration Value	16
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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2.2. SYS

Timebase Source: SysTick

* User modified value

3. System Configuration

3.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
GPIO	PE4	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	BTN0
	PE5	GPIO_Input	Input mode	No pull-up and no pull-down	n/a	BTN1
	PC13- ANTI_TAMP	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED0
	PC14- OSC32_IN	GPIO_Output	Output Push Pull	No pull-up and no pull-down	Low	LED1

3.2. DMA configuration

nothing configured in DMA service

3.3. NVIC configuration

3.3.1. NVIC

Interrupt Table	Enable	Preenemption 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
PVD interrupt through EXTI line 16		unused	
Flash global interrupt		unused	
RCC global interrupt		unused	
FPU global interrupt		unused	

3.3.2. 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
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

* User modified value

4. System Views

4.1. Category view

4.1.1. Current

5. Docs & Resources

Type	Link
BSDL files	https://www.st.com/resource/en/bsdl_model/stm32f405-415_407-417_bsdl.zip
IBIS models	https://www.st.com/resource/en/ibis_model/stm32f405-415_407-417_ibis.zip
System View Description	https://www.st.com/resource/en/svd/stm32f4_svd.zip
Presentations	https://www.st.com/resource/en/product_presentation/stm32-stm8_embedded_software_solutions.pdf
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stm32f2-stm32f4-and-stm32f7-series-dma-controller-stmicroelectronics.pdf

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Application Notes [https://www.st.com/resource/en/application_note/an4499-stm32--](https://www.st.com/resource/en/application_note/an4499-stm32-nrf51822-bluetooth-low-energy-system-solution-stmicroelectronics.pdf)
for related Tools [nrf51822-bluetooth-low-energy-system-solution-stmicroelectronics.pdf](https://www.st.com/resource/en/application_note/an4499-stm32-nrf51822-bluetooth-low-energy-system-solution-stmicroelectronics.pdf)

& Software

Application Notes https://www.st.com/resource/en/application_note/an4657-stm32-for-related-tools-in-application-programming-iap-using-the-usart-stmicroelectronics.pdf
& Software

Application Notes https://www.st.com/resource/en/application_note/an4666-parallel-for-related-tools-synchronous-transmission-using-gpio-and-dma-stmicroelectronics.pdf
& Software

Application Notes https://www.st.com/resource/en/application_note/an4678-full-duplex-spi-for-related-tools-emulation-for-stm32f4-microcontrollers-stmicroelectronics.pdf
& Software

Application Notes https://www.st.com/resource/en/application_note/an4701-proprietary-for-related-tools-code-readout-protection-on-microcontrollers-of-the-stm32f4-series-&Software-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an4739-stm32cube-for-related-tools-firmware-examples-for-stm32f4-series-stmicroelectronics.pdf
& Software

Application Notes https://www.st.com/resource/en/application_note/an4758-proprietary-for-related-tools-code-readout-protection-on-stm32l4-stm32l4-stm32g4-and-stm32wb-&Software-series-mcus-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an4759-using-the-for-related-tools-hardware-realtime-clock-rtc-and-the-tamper-management-unit-tamp-with-&Software-stm32-microcontrollers-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an4841-digital-signal-for-related-tools-processing-for-stm32-microcontrollers-using-cmsis-stmicroelectronics.pdf
& Software

Application Notes https://www.st.com/resource/en/application_note/an4968-proprietary-for-related-tools-code-read-out-protection-pcrop-on-stm32f72xxx-and-stm32f73xxx-&Software-microcontrollers-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an5054-secure-for-related-tools-programming-using-stm32cubeprogrammer-stmicroelectronics.pdf
& Software

Application Notes https://www.st.com/resource/en/application_note/an5056-integration-for-related-tools-guide-for-the-xcubesbsfu-stm32cube-expansion-package-&Software-stmicroelectronics.pdf

- Application Notes https://www.st.com/resource/en/application_note/an5360-getting-started-for-related-tools-with-projects-based-on-the-stm32mp1-series-in-stm32cubeide-&Software stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an5361-getting-started-for-related-tools-with-projects-based-on-dualcore-stm32h7-microcontrollers-in-&Software stm32cubeide-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an5394-getting-started-for-related-tools-with-projects-based-on-the-stm32l5-series-in-stm32cubeide-&Software stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an5418-how-to-build-a-simple-usbpd-sink-application-with-stm32cubemx-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an5426-migrating-graphics-middleware-projects-from-stm32cubemx-540-to-stm32cubemx-550-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an5464-position-control-of-a-threephase-permanent-magnet-motor-using-xcubemcsdk-or-xcubemcsdkful-stmicroelectronics.pdf
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- Application Notes https://www.st.com/resource/en/application_note/an5698-adapting-the-xcubestl-functional-safety-package-for-stm32-iec-61508-compliant-to-other-safety-standards-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an5731-stm32cubemx-and-stm32cubeide-threadsafe-solution-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4502-stm32-smbus-pmbus-expansion-package-for-stm32cube-stmicroelectronics.pdf
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- Datasheet <https://www.st.com/resource/en/datasheet/dm00037051.pdf>
- Programming https://www.st.com/resource/en/programming_manual/pm0214-stm32

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Manuals	cortexm4-mcus-and-mpus-programming-manual-stmicroelectronics.pdf
Reference Manuals	https://www.st.com/resource/en/reference_manual/rm0090-stm32f405415-stm32f407417-stm32f427437-and-stm32f429439-advanced-armbased-32bit-mcus-stmicroelectronics.pdf
Technical Notes & Articles	https://www.st.com/resource/en/technical_note/tn0516-overview-of-the-stm32f0xf100xxf103xx-and-stm32f2xxf30xf4xx-mcus-pmsm-single-dual-foc-sdk-v40-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
Technical Notes & Articles	https://www.st.com/resource/en/technical_note/tn1208-tape-and-reel-shipping-media-for-stm8-and-stm32-microcontrollers-in-tssop-and-ssop-packages-stmicroelectronics.pdf
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