



1. Description

1.1. Project

Project Name	test
Board Name	custom
Generated with:	STM32CubeMX 6.12.1
Date	11/12/2024

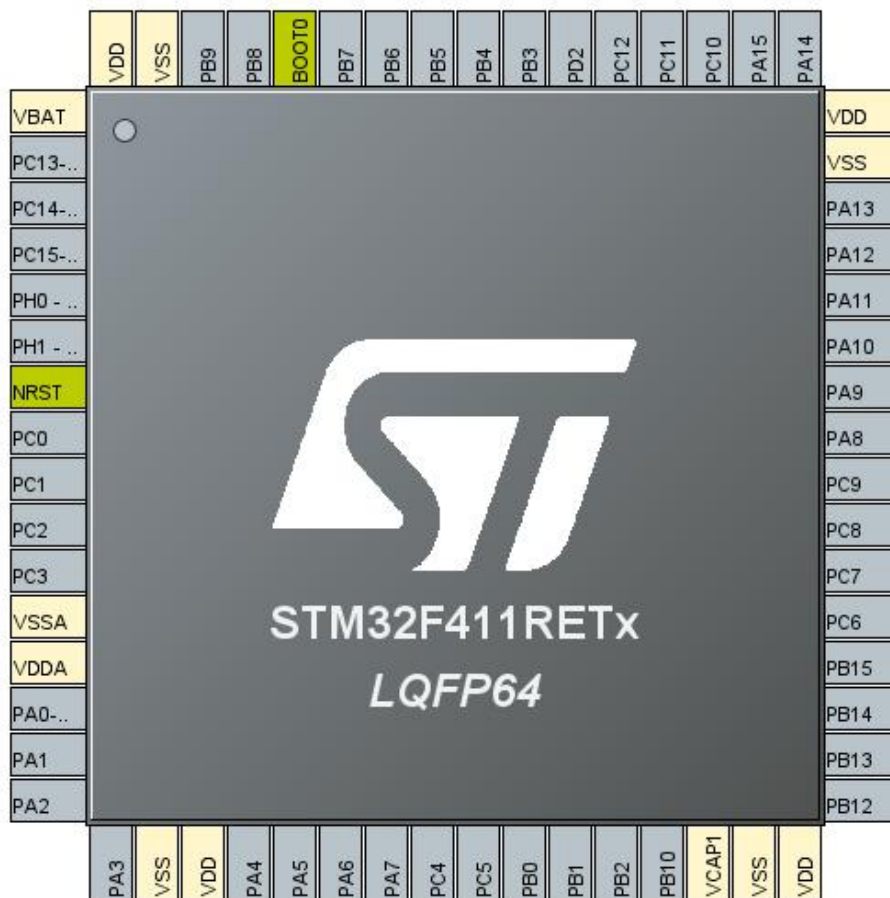
1.2. MCU

MCU Series	STM32F4
MCU Line	STM32F411
MCU name	STM32F411RETx
MCU Package	LQFP64
MCU Pin number	64

1.3. Core(s) information

Core(s)	Arm Cortex-M4
---------	---------------

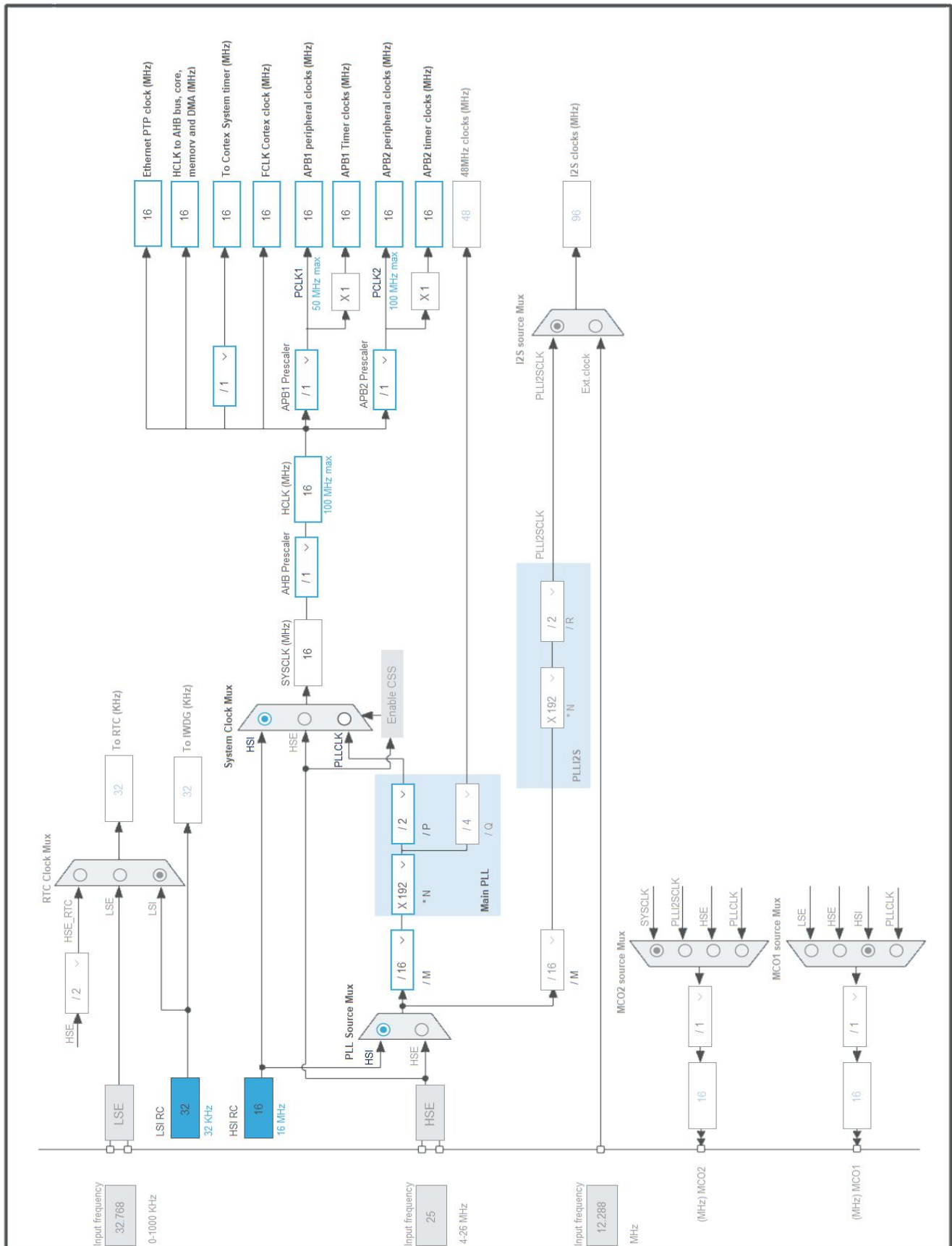
2. Pinout Configuration



3. Pins Configuration

Pin Number LQFP64	Pin Name (function after reset)	Pin Type	Alternate Function(s)	Label
1	VBAT	Power		
7	NRST	Reset		
12	VSSA	Power		
13	VDDA	Power		
18	VSS	Power		
19	VDD	Power		
30	VCAP1	Power		
31	VSS	Power		
32	VDD	Power		
47	VSS	Power		
48	VDD	Power		
60	BOOT0	Boot		
63	VSS	Power		
64	VDD	Power		

4. Clock Tree Configuration



1. Power Consumption Calculator report

1.1. Microcontroller Selection

Series	STM32F4
Line	STM32F411
MCU	STM32F411RETx
Datasheet	DS10314_Rev6

1.2. Parameter Selection

Temperature	25
Vdd	1.7

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

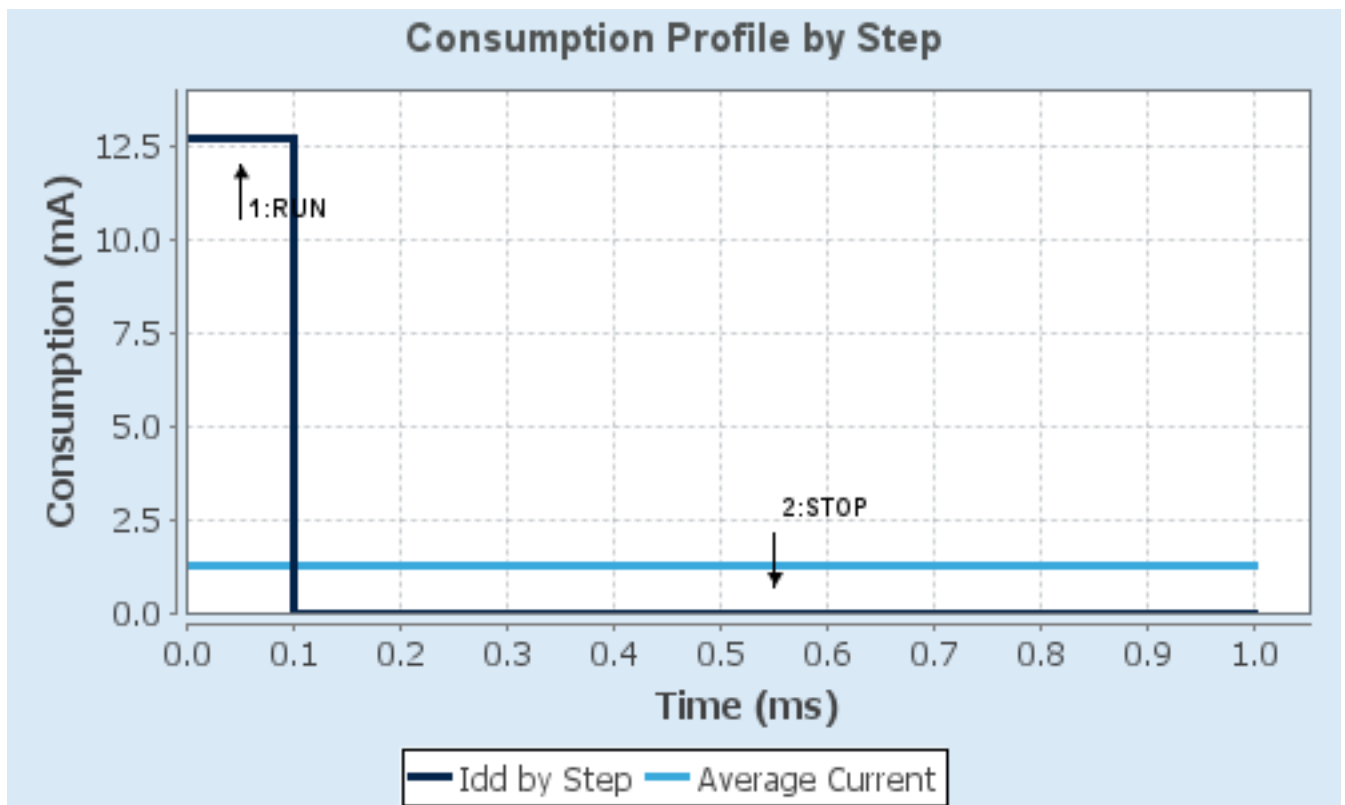
1.4. Sequence

Step	Step1	Step2
Mode	RUN	STOP
Vdd	1.7	1.7
Voltage Source	Battery	Battery
Range	Scale1-High	No Scale
Fetch Type	SRAM	n/a
CPU Frequency	100 MHz	0 Hz
Clock Configuration	HSE PLL	Regulator_LPLV Flash-PwrDwn
Clock Source Frequency	4 MHz	0 Hz
Peripherals		
Additional Cons.	0 mA	0 mA
Average Current	12.7 mA	9 μ A
Duration	0.1 ms	0.9 ms
DMIPS	125.0	0.0
Ta Max	103.99	105
Category	In DS Table	In DS Table

1.5. Results

Sequence Time	1 ms	Average Current	1.28 mA
Battery Life	3 months, 19 days, 6 hours	Average DMIPS	125.0 DMIPS

1.6. Chart



2. Software Project

2.1. Project Settings

Name	Value
Project Name	test
Project Folder	C:\Users\rladb\STM32CubeIDE\workspace_1.16.1\test
Toolchain / IDE	STM32CubeIDE
Firmware Package Name and Version	STM32Cube FW_F4 V1.28.1
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

3. *Peripherals and Middlewares Configuration*

3.1. RCC

3.1.1. Parameter Settings:

System Parameters:

VDD voltage (V)	3.3
Instruction Cache	Enabled
Prefetch Buffer	Enabled
Data Cache	Enabled
Flash Latency(WS)	0 WS (1 CPU cycle)

RCC Parameters:

HSI Calibration Value	16
TIM Prescaler Selection	Disabled
HSE Startup Timeout Value (ms)	100
LSE Startup Timeout Value (ms)	5000

Power Parameters:

Power Regulator Voltage Scale	Power Regulator Voltage Scale 1
-------------------------------	---------------------------------

* User modified value

4. System Configuration

4.1. GPIO configuration

IP	Pin	Signal	GPIO mode	GPIO pull/up pull down	Max Speed	User Label
----	-----	--------	-----------	---------------------------	--------------	------------

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
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	15	0
PVD interrupt through EXTI line 16	unused		
Flash global interrupt	unused		
RCC 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
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

5. System Views

5.1. Category view

5.1.1. Current

Middleware

System Core

Analog

Timers

Connectivity

Multimedia

Computing

DMA

NVIC 

RCC 

6. Docs & Resources

Type	Link
BSDL files	https://www.st.com/resource/en/bsdl_model/stm32f411_bsd.zip
IBIS models	https://www.st.com/resource/en/ibis_model/stm32f411_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
Presentations	https://www.st.com/resource/en/product_presentation/stm32_eval_tools_portfolio.pdf
Presentations	https://www.st.com/resource/en/product_presentation/stm32_stm8_functional-safety-packages.pdf
Presentations	https://www.st.com/resource/en/product_presentation/stm32-stm8_software_development_tools.pdf
Presentations	https://www.st.com/resource/en/product_presentation/microcontrollers-stm32-family-overview.pdf
Presentations	https://www.st.com/resource/en/product_presentation/microcontrollers-stm32h7rs-lines-overview.pdf
Brochures	https://www.st.com/resource/en/brochure/products-and-solutions-for-plcs-and-smart-i-os.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32f4x1.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32nucleo.pdf
Flyers	https://www.st.com/resource/en/flyer/flstmcsuite.pdf
Flyers	https://www.st.com/resource/en/flyer/flstm32trust.pdf
Product Certifications	https://www.st.com/resource/en/certification_document/stm32_authentication_can.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/an2945-stm8s-and-stm32-mcus-a-consistent-832bit-product-line-for-painless-migration-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an3070-managing-the-driver-enable-signal-for-rs485-and-iolink-communications-with-the-stm32s-usart-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/an3154-can-protocol-used-in-the-stm32-bootloader-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/an3156-usb-dfu-protocol-used-in-the-stm32-bootloader-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an3364-migration-and-compatibility-guidelines-for-stm32-microcontroller-applications-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an3997-audio-playback-and-recording-using-the-stm32f4discovery-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an3998-pdm-audio-software-decoding-on-stm32-microcontrollers-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an4031-using-the-stm32f2-stm32f4-and-stm32f7-series-dma-controller-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/an4488-getting-started-with-stm32f4xxx-mcu-hardware-development-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an4566-extending-the-dac-performance-of-stm32-microcontrollers-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an4616-migrating-from-stm32f401-and-stm32f411-lines-to-stm32l4-series-and-stm32l4-series-microcontrollers-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an4646-peripheral-interconnections-on-stm32f401-and-stm32f411-lines-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/an4739-stm32cube-firmware-examples-for-stm32f4-series-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/an4850-stm32-mcus-spreadspectrum-clock-generation-principles-properties-and-implementation-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an4904-migration-of-microcontroller-applications-from-stm32f1-series-to-stm32f4-access-lines-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an4989-stm32-microcontroller-debug-toolbox-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an4995-using-an-electromyogram-technique-to-detect-muscle-activity-

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/an5073-receiving-spdif-audio-stream-with-the-stm32f4f7h7-series-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/an4838-introduction-to-memory-protection-unit-management-on-stm32-mcus-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an5852-migrating-from-stm32f401-stm32f410-and-stm32f411-to-stm32h503-mcus-stmicroelectronics.pdf
- Application Notes https://www.st.com/resource/en/application_note/an4879-introduction-to-usb-hardware-and-pcb-guidelines-using-stm32-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/an5537-how-to-use-adc-oversampling-techniques-to-improve-signal-to-noise-ratio-on-stm32-mcus-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/an4013-introduction-to-timers-for-stm32-mcus-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an4277-how-to-use-pwm-shutdown-for-motor-control-and-digital-power-conversion-on-stm32-mcus-stmicroelectronics.pdf

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

Application Notes https://www.st.com/resource/en/application_note/an4908-getting-started-with-usart-automatic-baud-rater-detection-for-stm32-mcus-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an5156-introduction-to-security-for-stm32-mcus-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an5543-guidelines-for-enhanced-spi-communication-on-stm32-mcus-and-mpus-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an1202_freertos_guide-for_related_Tools_freertos-guide-stmicroelectronics.pdf

& Software

Application Notes https://www.st.com/resource/en/application_note/an1602_semihosting_in_for_related_Tools_truestudio-how-to-do-semihosting-in-truestudio-stmicroelectronics.pdf

& Software

Application Notes https://www.st.com/resource/en/application_note/an1801_stm32cubeprog_for_related_Tools_rammer_in_truestudio-installing-stm32cubeprogrammer-in-truestudio-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/atollic_editing_keyboard_for_related_Tools_shortcuts-atollic-editing-keyboard-shortcuts-stmicroelectronics.pdf

& Software

Application Notes https://www.st.com/resource/en/application_note/iar_to_atollic_truestudio_for_related_Tools_migration_guide-truestudio-for-arm-migration-guide-iar-embedded-workbench-to-truestudio-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/stm32cubemx_installatio

for related Tools n_in_truestudio-stm32cubemx-installation-in-truestudio-
& Software stmicroelectronics.pdf

Application Notes [https://www.st.com/resource/en/application_note/an2656-stm32f10xxx-](https://www.st.com/resource/en/application_note/an2656-stm32f10xxx-lcd-glass-driver-firmware-stmicroelectronics.pdf)
for related Tools lcd-glass-driver-firmware-stmicroelectronics.pdf
& Software

Application Notes [https://www.st.com/resource/en/application_note/an2790-tft-lcd-](https://www.st.com/resource/en/application_note/an2790-tft-lcd-interfacing-with-the-highdensity-stm32f10xxx-fsmc-stmicroelectronics.pdf)
for related Tools interfacing-with-the-highdensity-stm32f10xxx-fsmc-stmicroelectronics.pdf
& Software

Application Notes [https://www.st.com/resource/en/application_note/an3078-stm32-](https://www.st.com/resource/en/application_note/an3078-stm32-inapplication-programming-over-the-ic-bus-stmicroelectronics.pdf)
for related Tools inapplication-programming-over-the-ic-bus-stmicroelectronics.pdf
& Software

Application Notes [https://www.st.com/resource/en/application_note/an3116-stm32s-adc-](https://www.st.com/resource/en/application_note/an3116-stm32s-adc-modes-and-their-applications-stmicroelectronics.pdf)
for related Tools modes-and-their-applications-stmicroelectronics.pdf
& Software

Application Notes [https://www.st.com/resource/en/application_note/an3174-implementing-](https://www.st.com/resource/en/application_note/an3174-implementing-receivers-for-infrared-remote-control-protocols-using-stm32f10xxx-microcontrollers-stmicroelectronics.pdf)
for related Tools receivers-for-infrared-remote-control-protocols-using-stm32f10xxx-
& Software microcontrollers-stmicroelectronics.pdf

Application Notes [https://www.st.com/resource/en/application_note/an3241-qvga-tftlcd-](https://www.st.com/resource/en/application_note/an3241-qvga-tftlcd-direct-drive-using-the-stm32f10xx-fsmc-peripheral-stmicroelectronics.pdf)
for related Tools direct-drive-using-the-stm32f10xx-fsmc-peripheral-stmicroelectronics.pdf
& Software

Application Notes [https://www.st.com/resource/en/application_note/an3307-guidelines-for-](https://www.st.com/resource/en/application_note/an3307-guidelines-for-obtaining-iec-60335-class-b-certification-for-any-stm32-application-stmicroelectronics.pdf)
for related Tools obtaining-iec-60335-class-b-certification-for-any-stm32-application-
& Software stmicroelectronics.pdf

Application Notes [https://www.st.com/resource/en/application_note/an3965-](https://www.st.com/resource/en/application_note/an3965-stm32f40xstm32f41x-inapplication-programming-using-the-usart-stmicroelectronics.pdf)
for related Tools stm32f40xstm32f41x-inapplication-programming-using-the-usart-
& Software stmicroelectronics.pdf

Application Notes [https://www.st.com/resource/en/application_note/an3969-eeeprom-](https://www.st.com/resource/en/application_note/an3969-eeeprom-emulation-in-stm32f40xstm32f41x-microcontrollers-stmicroelectronics.pdf)
for related Tools emulation-in-stm32f40xstm32f41x-microcontrollers-stmicroelectronics.pdf
& Software

Application Notes [https://www.st.com/resource/en/application_note/an4044-floating-point-](https://www.st.com/resource/en/application_note/an4044-floating-point-unit-demonstration-on-stm32-microcontrollers-stmicroelectronics.pdf)
for related Tools unit-demonstration-on-stm32-microcontrollers-stmicroelectronics.pdf
& Software

Application Notes [https://www.st.com/resource/en/application_note/an4323-getting-started-](https://www.st.com/resource/en/application_note/an4323-getting-started-with-stemwin-library-stmicroelectronics.pdf)
for related Tools with-stemwin-library-stmicroelectronics.pdf

& Software

Application Notes https://www.st.com/resource/en/application_note/an4365-using-stm32f4-for-related-Tools-mcu-power-modes-with-best-dynamic-efficiency-stmicroelectronics.pdf

& Software

Application Notes https://www.st.com/resource/en/application_note/an4435-guidelines-for-obtaining-ulcsaiec-607301603351-class-b-certification-in-any-stm32-application-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an4457-implementing-an-emulated-uart-on-stm32f4-microcontrollers-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an4499-stm32--nrf51822-bluetooth-low-energy-system-solution-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an4515-using-batch-acquisition-mode-bam-to-maximize-power-efficiency-on-stm32f410-stm32f411-stm32f412-stm32f413-microcontroller-lines-stmicroelectronics.pdf

Application Notes https://www.st.com/resource/en/application_note/an4657-stm32-inapplication-programming-iap-using-the-usart-stmicroelectronics.pdf

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

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

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

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

Application Notes https://www.st.com/resource/en/application_note/an4758-proprietary-code-readout-protection-on-stm32l4-stm32l4-stm32g4-and-stm32wb-

& Software	series-mcus-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an4841-digital-signal-processing-for-stm32-microcontrollers-using-cmsis-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an4968-proprietary-code-read-out-protection-pcrop-on-stm32f72xxx-and-stm32f73xxx-microcontrollers-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5056-integration-guide-for-the-xcubesbsfu-stm32cube-expansion-package-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5360-getting-started-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
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5418-how-to-build-a-simple-usbp-d-sink-application-with-stm32cubemx-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5426-migrating-graphics-middleware-projects-from-stm32cubemx-540-to-stm32cubemx-550-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5464-position-control-of-a-three-phase-permanent-magnet-motor-using-xcubemcsdk-or-xcubemcsdkful-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5564-getting-started-with-projects-based-on-dualcore-stm32wl-microcontrollers-in-stm32cubeide-stmicroelectronics.pdf
Application Notes for related Tools & Software	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 for related Tools & Software	https://www.st.com/resource/en/application_note/an5731-stm32cubemx-and-stm32cubeide-threadsafe-solution-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an4502-stm32-smbuspmbus-expansion-package-for-stm32cube-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5952-how-to-use-cmake-in-stm32cubeide-stmicroelectronics.pdf
Application Notes for related Tools & Software	https://www.st.com/resource/en/application_note/an5054-how-to-perform-secure-programming-using-stm32cubeprogrammer-stmicroelectronics.pdf
Design Notes & Tips	https://www.st.com/resource/en/design_tip/dt0088-fir-filter-design-by-sampling-windowing-and-modulating-the-sinc-function-stmicroelectronics.pdf
Design Notes & Tips	https://www.st.com/resource/en/design_tip/dt0089-the-goertzel-algorithm-to-compute-individual-terms-of-the-discrete-fourier-transform-dft-stmicroelectronics.pdf
Design Notes & Tips	https://www.st.com/resource/en/design_tip/dt0091-lattice-wave-digital-filter-design-and-automatic-c-code-generation-stmicroelectronics.pdf
Design Notes & Tips	https://www.st.com/resource/en/design_tip/dt0092-lattice-wave-digital-filter-test-and-performance-verification-stmicroelectronics.pdf
Device Option Lists	https://www.st.com/resource/en/device_option_list/opl_stm32f411_512k.zip
Errata Sheets	https://www.st.com/resource/en/errata_sheet/es0287-stm32f411xcxe-device-errata-stmicroelectronics.pdf
Datasheet	https://www.st.com/resource/en/datasheet/dm00115249.pdf
Programming Manuals	https://www.st.com/resource/en/programming_manual/pm0214-stm32-cortexm4-mcus-and-mpus-programming-manual-stmicroelectronics.pdf
Reference Manuals	https://www.st.com/resource/en/reference_manual/rm0383-stm32f411xce-advanced-armed-based-32bit-mcus-stmicroelectronics.pdf
Technical Notes & Articles	https://www.st.com/resource/en/technical_note/tn0516-overview-of-the-stm32f0xf100xxf103xx-and-stm32f2xxf30xf4xx-mcus-pmsm-singledual-

	foc-sdk-v40-stmicroelectronics.pdf
Technical Notes & Articles	https://www.st.com/resource/en/technical_note/tn1163-description-of-wlcsp-for-microcontrollers-and-recommendations-for-its-use-stmicroelectronics.pdf
Technical Notes & Articles	https://www.st.com/resource/en/technical_note/tn1204-tape-and-reel-shipping-media-for-stm32-microcontrollers-in-bga-packages-stmicroelectronics.pdf
Technical Notes & Articles	https://www.st.com/resource/en/technical_note/tn1205-tape-and-reel-shipping-media-for-stm8-and-stm32-microcontrollers-in-fpn-packages-stmicroelectronics.pdf
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
Technical Notes & Articles	https://www.st.com/resource/en/technical_note/tn1433-reference-device-marking-schematics-for-stm32-microcontrollers-and-microprocessors-stmicroelectronics.pdf
Technical Notes & Articles	https://www.st.com/resource/en/technical_note/tn1489-security-bulletin-tn1489stpsirt-physical-attacks-on-stm32-and-stm32cube-firmware-stmicroelectronics.pdf