



1. Description

1.1. Project

| | |
|-----------------|---------------------------|
| Project Name | STM32F401CCU6_USB_Example |
| Board Name | custom |
| Generated with: | STM32CubeMX 6.16.1 |
| Date | 02/10/2026 |

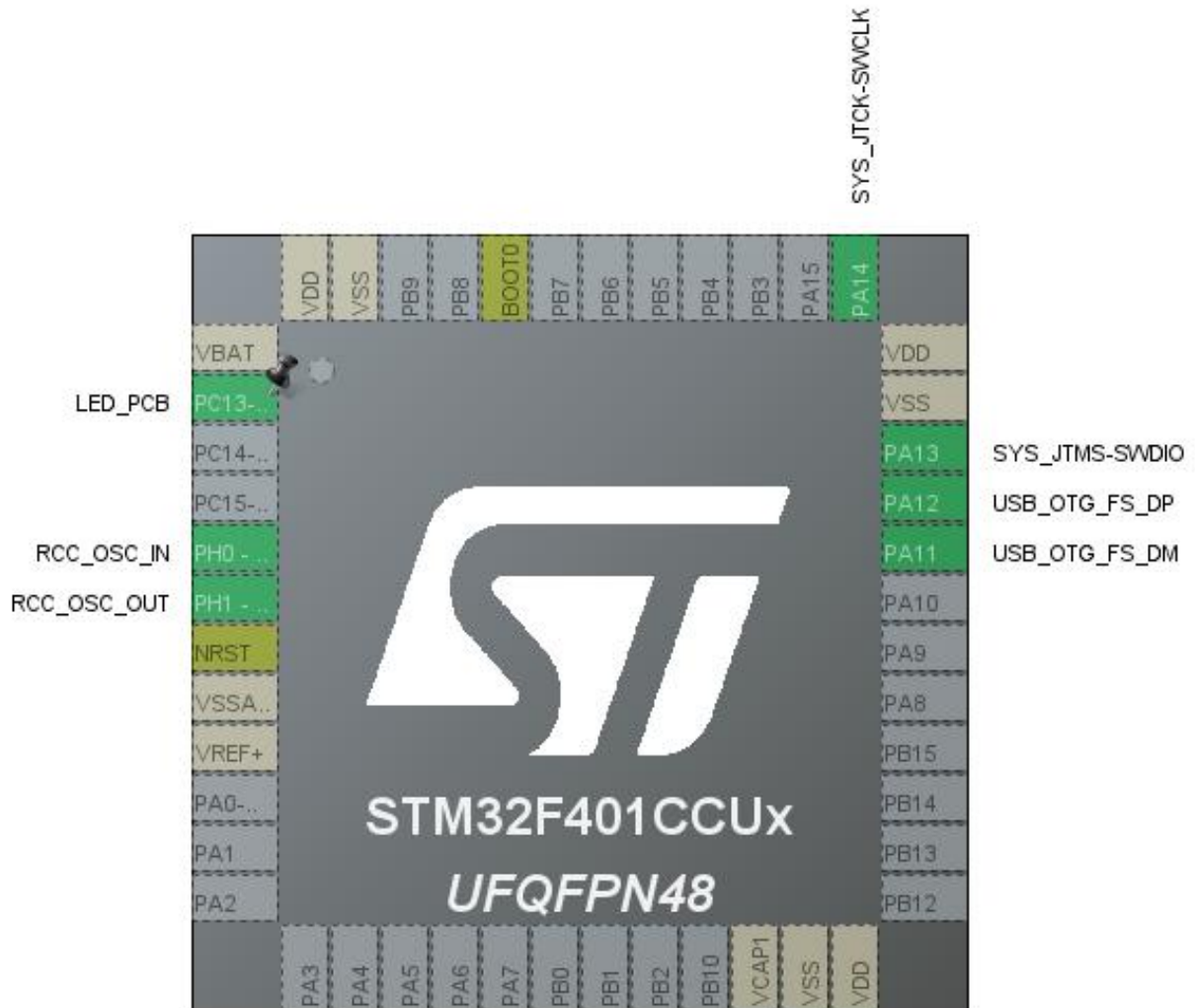
1.2. MCU

| | |
|----------------|---------------|
| MCU Series | STM32F4 |
| MCU Line | STM32F401 |
| MCU name | STM32F401CCUx |
| MCU Package | UFQFPN48 |
| MCU Pin number | 48 |

1.3. Core(s) information

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

2. Pinout Configuration

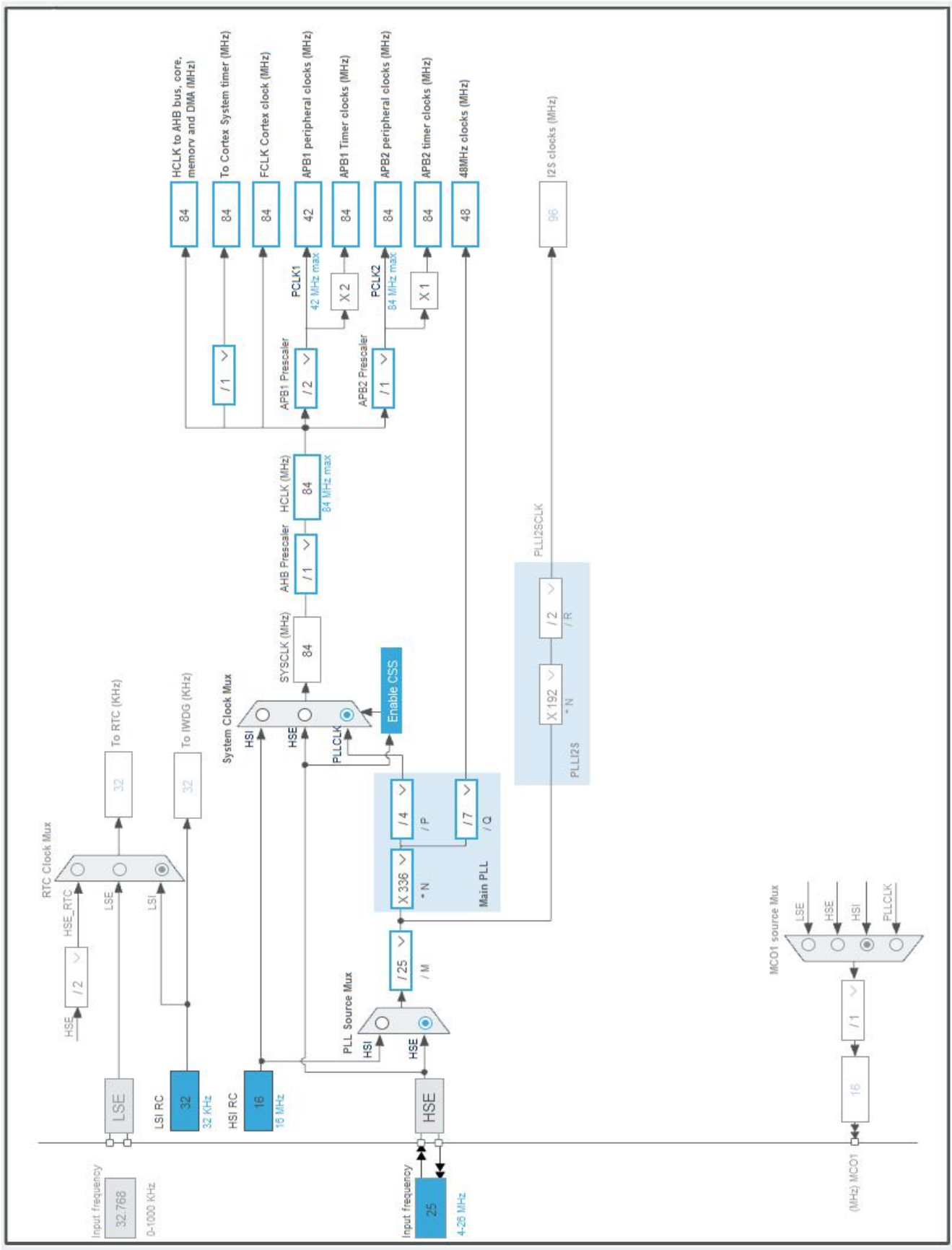


3. Pins Configuration

| Pin Number UFQFPN48 | Pin Name (function after reset) | Pin Type | Alternate Function(s) | Label |
|------------------------|---------------------------------------|----------|--------------------------|---------|
| 1 | VBAT | Power | | |
| 2 | PC13-ANTI_TAMP * | I/O | GPIO_Output | LED_PCB |
| 5 | PH0 - OSC_IN | I/O | RCC_OSC_IN | |
| 6 | PH1 - OSC_OUT | I/O | RCC_OSC_OUT | |
| 7 | NRST | Reset | | |
| 8 | VSSA/VREF- | Power | | |
| 9 | VREF+ | Power | | |
| 22 | VCAP1 | Power | | |
| 23 | VSS | Power | | |
| 24 | VDD | Power | | |
| 32 | PA11 | I/O | USB_OTG_FS_DM | |
| 33 | PA12 | I/O | USB_OTG_FS_DP | |
| 34 | PA13 | I/O | SYS_JTMS-SWDIO | |
| 35 | VSS | Power | | |
| 36 | VDD | Power | | |
| 37 | PA14 | I/O | SYS_JTCK-SWCLK | |
| 44 | BOOT0 | Boot | | |
| 47 | VSS | Power | | |
| 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 | STM32F4 |
| Line | STM32F401 |
| MCU | STM32F401CCUx |
| Datasheet | DS9716_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 |

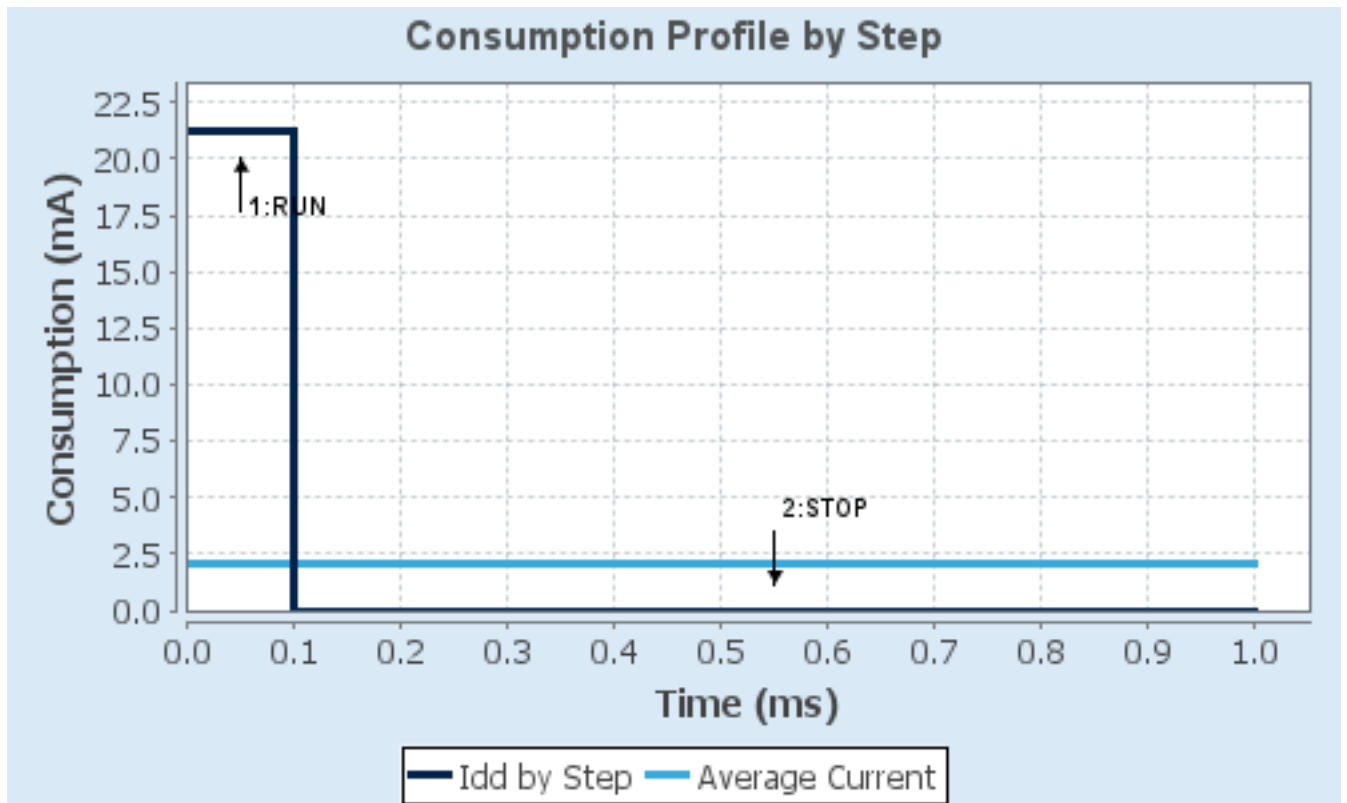
1.4. Sequence

| | | |
|-------------------------------|--------------------|-----------------------------|
| Step | Step1 | Step2 |
| Mode | RUN | STOP |
| Vdd | 3.3 | 3.3 |
| Voltage Source | Battery | Battery |
| Range | Scale2-Medium | No Scale |
| Fetch Type | FLASH/ART/PREFETCH | n/a |
| CPU Frequency | 84 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 | 21.2 mA | 10 μ A |
| Duration | 0.1 ms | 0.9 ms |
| DMIPS | 105.0 | 0.0 |
| Ta Max | 102.76 | 105 |
| Category | In DS Table | In DS Table |

1.5. Results

| | | | |
|---------------|-------------------------------|-----------------|-------------|
| Sequence Time | 1 ms | Average Current | 2.13 mA |
| Battery Life | 2 months, 5 days, 14 hours | Average DMIPS | 105.0 DMIPS |

1.6. Chart



2. Software Project

2.1. Project Settings

| Name | Value |
|-----------------------------------|---|
| Project Name | STM32F401CCU6_USB_Example |
| Project Folder | D:\Work_Radio\STM32\WorkSpace\STM32F401CCU6_USB_Example |
| Toolchain / IDE | STM32CubeIDE |
| Firmware Package Name and Version | STM32Cube FW_F4 V1.28.3 |
| 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 |
| 2 | MX_GPIO_Init | GPIO |
| 3 | MX_USB_OTG_FS_PCD_Init | USB_OTG_FS |

3. Peripherals and Middlewares Configuration

3.1. RCC

High Speed Clock (HSE): Crystal/Ceramic Resonator

3.1.1. 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 | 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 2 |
|-------------------------------|---------------------------------|

3.2. SYS

Debug: Serial Wire

Timebase Source: SysTick

3.3. USB_OTG_FS

Mode: Device_Only

3.3.1. Parameter Settings:

| | |
|-----------------------|----------------------------|
| Speed | Device Full Speed 12MBit/s |
| Low power | Disabled |
| Link Power Management | Disabled |
| VBUS sensing | Disabled |
| Signal start of frame | Disabled |

* 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 | PH0 - OSC_IN | RCC_OSC_IN | n/a | n/a | n/a | |
| | PH1 - 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 | |
| USB_OTG_FS | PA11 | USB_OTG_FS_DM | Alternate Function Push Pull | No pull-up and no pull-down | Very High * | |
| | PA12 | USB_OTG_FS_DP | Alternate Function Push Pull | No pull-up and no pull-down | Very High * | |
| GPIO | PC13-ANTI_TAMP | GPIO_Output | Output Push Pull | No pull-up and no pull-down | Low | LED_PCB |

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 |
| USB On The Go FS global interrupt | true | 0 | 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 |
| USB On The Go FS 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

Computing

DMA

GPIO ✓

NVIC ✓

RCC ✓

SYS ✓

USB_FS ✓

6. Docs & Resources

| Type | Link |
|-------------------------|---|
| BSDL files | https://www.st.com/resource/en/bsdl_model/stm32f401_bsdl.zip |
| IBIS models | https://www.st.com/resource/en/ibis_model/stm32f401_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 |
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| Flyers | https://www.st.com/resource/en/flyer/flstm32nucleo.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 |
| Security Bulletin | https://www.st.com/resource/en/technical_note/tn1489-security-bulletin-tn1489stpsirt-physical-attacks-on-stm32-and-stm32cube-firmware-stmicroelectronics.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/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

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Application Notes https://www.st.com/resource/en/application_note/an4031-using-the-stm32f2-stm32f4-and-stm32f7-series-dma-controller-stmicroelectronics.pdf

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stmicroelectronics.pdf

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for related Tools [with-projects-based-on-dualcore-stm32h7-microcontrollers-in-](#)
& Software [stm32cubeide-stmicroelectronics.pdf](#)

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for related Tools [with-projects-based-on-the-stm32l5-series-in-stm32cubeide-](#)
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for related Tools [simple-usbpd-sink-application-with-stm32cubemx-stmicroelectronics.pdf](#)

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