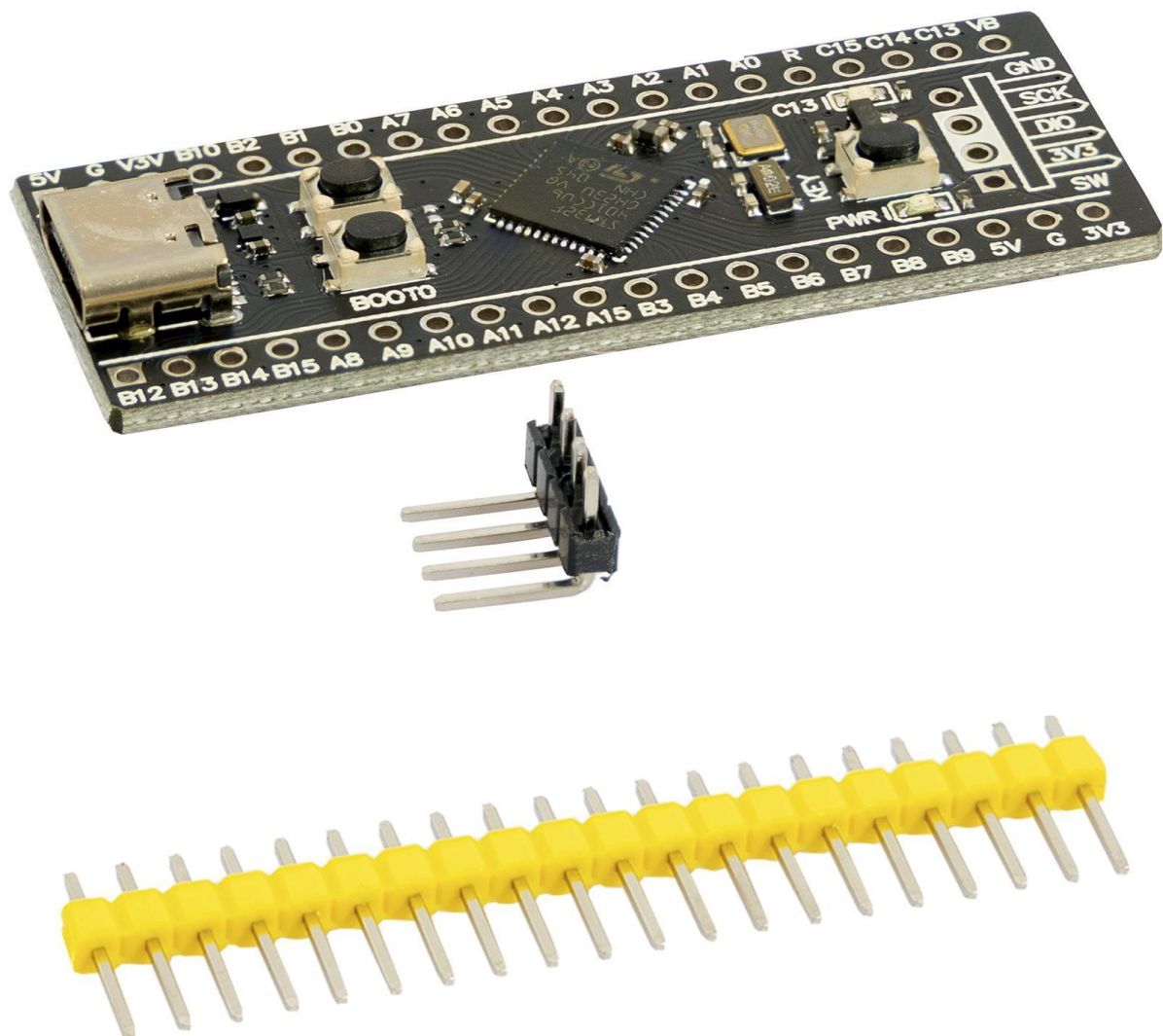


STM32F401 Development Board

datasheet

# STM32F401 Development Board

V 3.0



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## Description

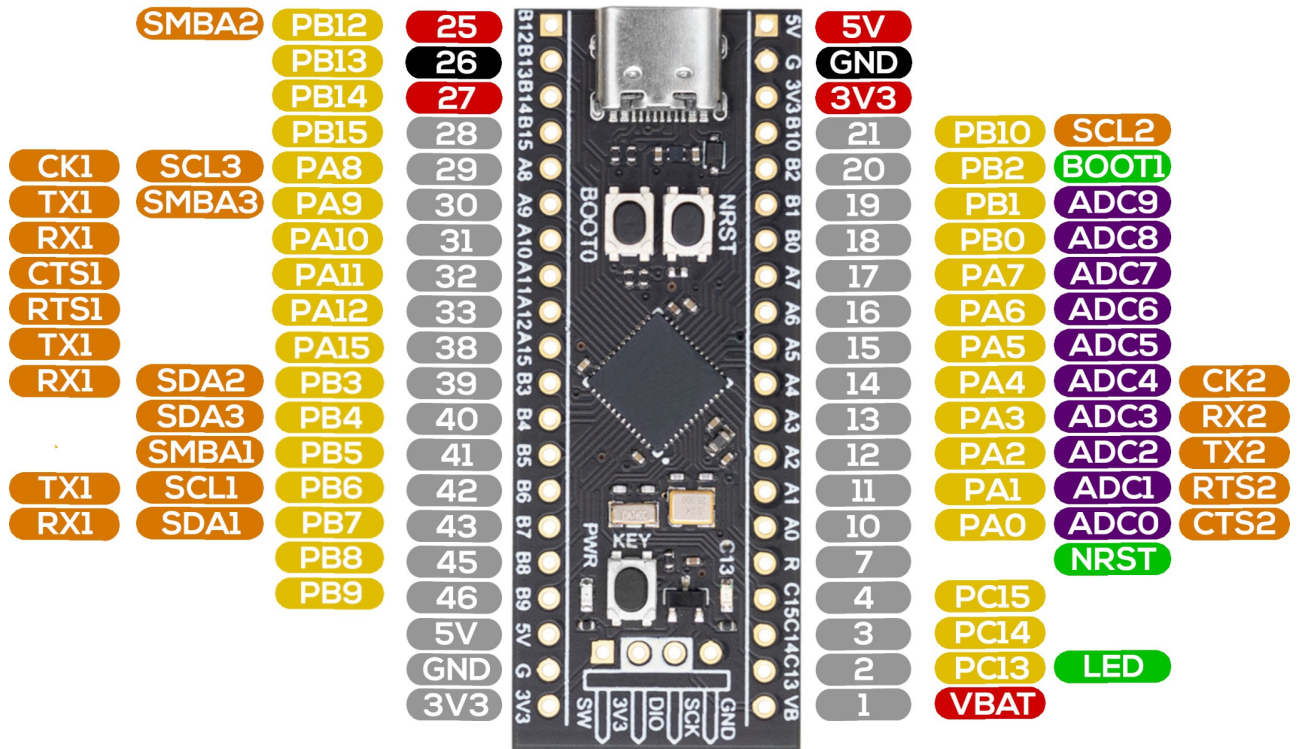
The STM32F401 'Black pill' development board is based on the high-performance ARM Cortex -M4 32 bit RISC core, operating at up to 84 MHz. The STM32F401 incorporate high-speed embedded memories (512 Kbytes of Flash memory, 96 Kbytes of SRAM), one 12-bit ADC, a low-power RTC, six general-purpose 16-bit timers including one PWM timer for motor control, two general-purpose 32-bit timers.

## Hardware

The STM32F401CE based Black Pill V3.0+ Board provides the following hardware components:

- STM32F401CEU6 in UFQFPN48 package
- ARM® 32-bit Cortex® -M4 CPU with FPU
- 84 MHz max CPU frequency
- VDD from 1.7 V to 3.6 V
- 512 KB Flash
- 96 KB SRAM
- GPIO with external interrupt capability
- 1x12-bit, 2.4 MSPS ADC with 16 channels
- DMA Controller
- Up to 11 Timers (six 16-bit, two 32-bit, two watchdog timers and a SysTick timer)
- USART/UART (3)
- I2C (3)
- SPI (4)
- I2S (2)
- SDIO
- USB 2.0 full-speed device/host/OTG controller with on-chip PHY
- CRC calculation unit
- 96-bit unique ID

## Pinout Diagram



## Default Mapping

- UART\_1 TX/RX : PA9/PA10
- I2C1 SCL/SDA : PB8/PB9
- SPI1 CS/SCK/MISO/MOSI : PA4/PA5/PA6/PA7 PWM\_4\_CH1 : PB6
- PWM\_4\_CH2 : PB7
- ADC\_1 : PA1
- USER\_PB : PA0
- USER\_LED : PC13

## Programming and Debugging

There are 2 main entry points for flashing STM32F4X SoCs, one using the ROM bootloader, and another by using the SWD debug port (which requires additional hardware). Flashing using the ROM bootloader requires a special activation pattern, which can be triggered by pressing the BOOT0 key and reset key. Release the reset key and release the BOOT0 key after 0.5 seconds.

## Further Information

This datasheet provides basic information about the development Board, for further information about the STM32F401 MCU please refer to the original STM32F401 datasheet found here: [az-delivery.de/stm32f401ce](http://az-delivery.de/stm32f401ce)