STM32F411 BlackPill Development Board

DFR0864

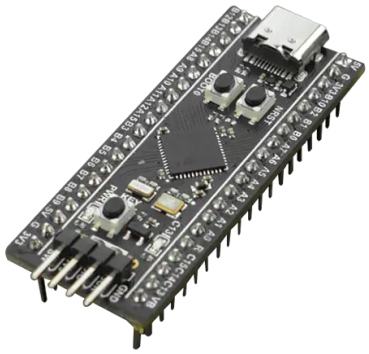
Product Overview

11-08-2022

For the most up-to-date information, visit www.mouser.com or the supplier's website.

Description

The STM32F411 BlackPill Development Board from DFRobot is a compact STM32F411 development board that can be embedded into projects. It features the STM32F411CEU6 chip with 512KB of ROM, 128KB of SRAM and runs at 100MHz. There is a spot on the bottom for SOIC flash memory, which allows soldering an SPI flash memory for more space for data logging or file storage.



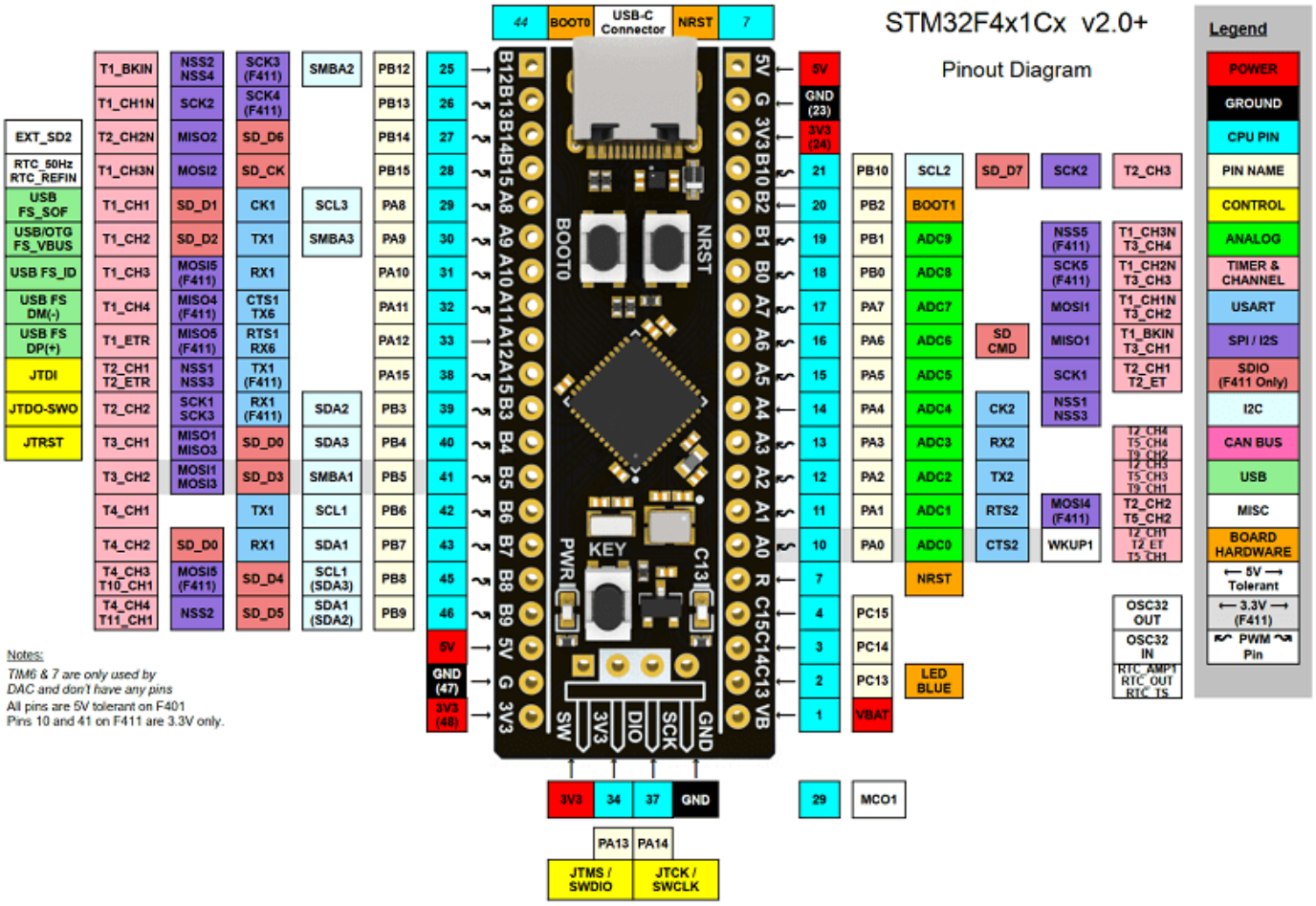
Features

- STM32F411CEU6 100Mhz, 128KB RAM, 512KB ROM
- 25MHZ high-speed crystal & 32.768Khz 6PF low-speed crystal
- Immersion gold technology and lead-free, gold-plated pin headers, more environmentally friendly
- Flash pads have been reserved, and USBDisk & FATFFS routines are provided
- Support MicroPython programming, and provide usable MicroPython firmware
- Support Arduino programming
- Support C language programming development
- Version V3.0, there are 3 buttons: reset button, BOOT0 button, user button
- Provide CMSIS-DAP firmware, which can be turned into a download burner
- Use the new original ST chip, a high-quality crystal oscillator

Specifications

- 1x STM32F411 development board
- 1x 4pin curved pin
- 2x 20pin straight pin

Typical Connections



Learn more about

- STMicroelectronics STM32 F4 Cortex™-M4 MCUs

Mouser Part Number

View Part

To learn more, visit
https://www.mouser.com/new/dfrobot/dfrobot-stm32f411-blackpill-board/

WeAct Black Pill V2.0

STM32F411CEU6

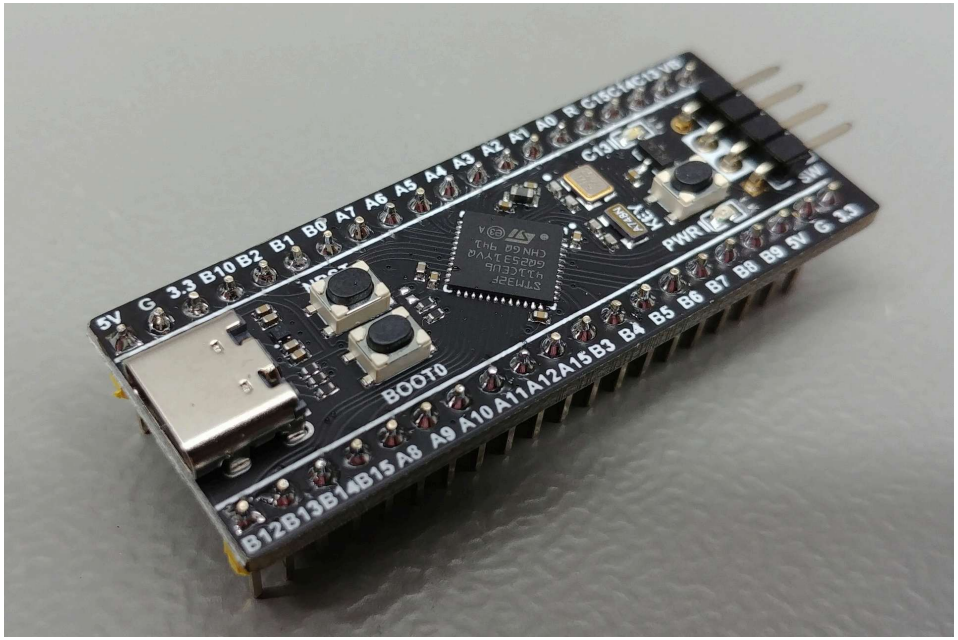
Board

Name	WeAct Black Pill V2.0
Part	Unknown
Brand	WeAct Studio
Origin	China

Microcontroller

Part	STM32F411CEU6
Manufacturer	ST-Microelectronics
Core	Arm Cortex-M4
Max. Clock Speed	100MHz
Package	UFQFPN 48 pins

Pictures



WeAct Black Pill V2.0: Perspective view

Internal memories

FLASH	512KiB
SRAM	128KiB

Oscillators

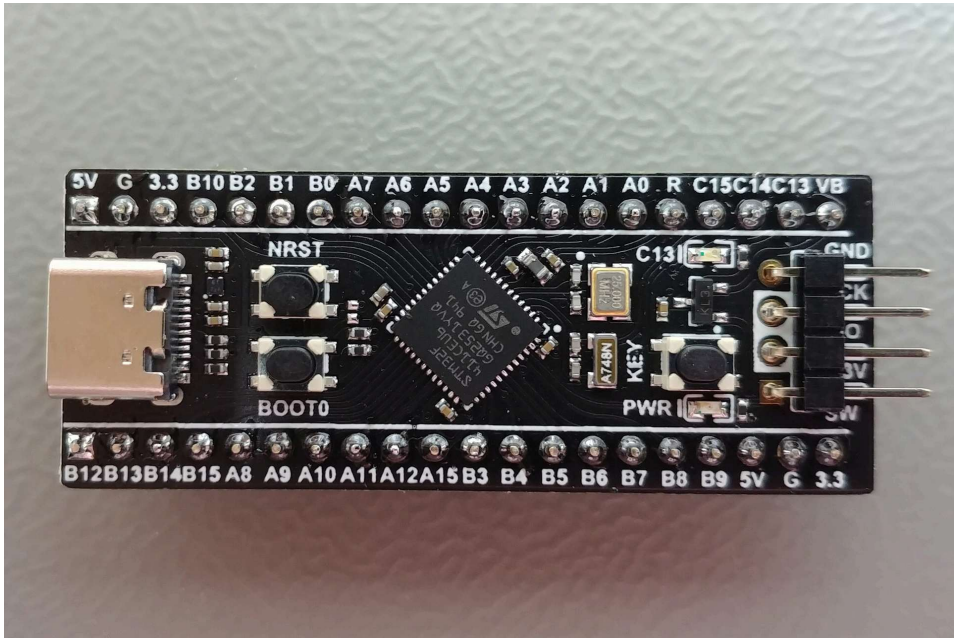
HSI	16MHz
LSI	32kHz
HSE	25MHz
LSE	32.768kHz

Power

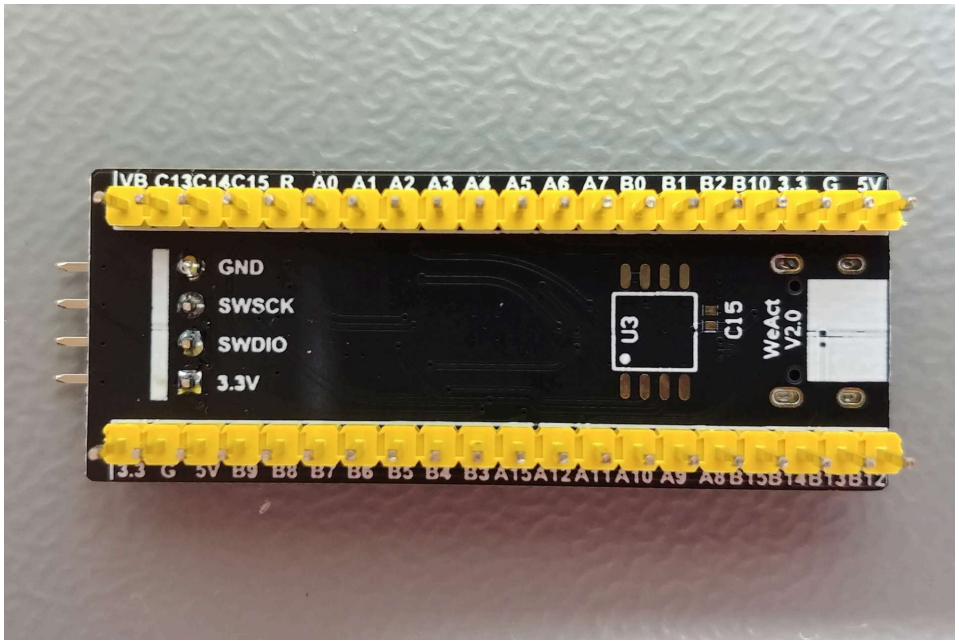
Sources	Any +3.3V pin (+3.3V) Any +5V pin (+5V) USB connector (+5V)
V_{DDA} pin	No
V_{SSA} pin	No
V_{REF-} pin	No
V_{REF+} pin	No
Backup battery	Pin

Regulator

Manufacturer	Diodes Incorporated
Part	AP7343 (6T)



WeAct Black Pill V2.0: Top view



WeAct Black Pill V2.0: Bottom view

Package	X2-DFN1010-4 4 pins
Input	+3.52V to +5.25V
Output	+3.3V @ 300mA
Datasheet	AP7343.pdf

PCB

Color	Black
Size (w x l)	20.78mm x 52.81mm
Mounting	Breadboard

Resources

- Perspective view
- Top view
- Bottom view
- Original schematic
- Original dimensions drawing
- Source files on Github

Remarks

- **Warning:** The +5V pins on this board are directly connected to the +5V pin of the USB connector. There is no protection in place. Do not power this board through USB and an external power supply at the same time.

Inputs

- Reset button
- BOOT0 button
- User button

Outputs

- Power LED
- User LED

Connectors

- Header 1
- Header 2
- USB connector
- SWD header

Devices

- Generic EEPROM

Inputs & outputs

Reset button

Name	NRST
Reference	-
Type	Button
Connected to	$\overline{\text{NRST}}$
Mode	Active low

Power LED

Name	PWR
Reference	-
Type	LED
Connected to	+3.3V rail
Mode	N.A.

BOOT0 button

Name	BOOT0
Reference	-
Type	Button
Connected to	BOOT0
Mode	Active high

User LED

Name	PC13
Reference	-
Type	LED
Connected to	PC13
Mode	Sink

User button

Name	KEY
Reference	-
Type	Button
Connected to	PA0
Mode	Active low

Connectors & headers

⇄ Header 1 properties

Name	Unknown
Reference	None
Type	pin header (2.54mm, 20x1, male)

⇄ Header 1 pins

#	Name	Function	Connected to
1	5V	-	+5V rail
2	G	-	Ground plane
3	3.3	-	+3.3V rail
4	B10	-	PB10
5	B2	-	PB2
6	B1	-	PB1
7	B0	-	PB0
8	A7	-	PA7
9	A6	-	PA6
10	A5	-	PA5
11	A4	-	PA4
12	A3	-	PA3
13	A2	-	PA2
14	A1	-	PA1
15	A0	-	PA0
16	R	-	$\overline{\text{NRST}}$
17	C15	-	PC15

18	C14	-	PC14
19	C13	-	PC13
20	VB	-	V_{BAT}

⇄ Header 2 properties

Name	Unknown
Reference	None
Type	pin header (2.54mm, 20x1, male)

⇄ Header 2 pins

#	Name	Function	Connected to
1	B12	-	PB12
2	B13	-	PB13
3	B14	-	PB14
4	B15	-	PB15
5	A8	-	PA8
6	A9	-	PA9
7	A10	-	PA10
8	A11	-	PA11
9	A12	-	PA12
10	A15	-	PA15
11	B3	-	PB3
12	B4	-	PB4
13	B5	-	PB5
14	B6	-	PB6
15	B7	-	PB7
16	B8	-	PB8

17	B9	-	PB9
18	5V	-	+5V rail
19	G	-	Ground plane
20	3.3	-	+3.3V rail

USB connector properties

Name	Unknown
Reference	None
Type	USB C

USB connector pins

#	Name	Function	Connected to
A1/B12	-	GND	Ground plane
A4/B9	-	VBUS	+5V rail
B8	-	SBU2	Ground plane via 5.1kΩ (R8)
A5	-	CC1	Ground plane via 5.1kΩ (R8)
B7	-	D-	PA11 via 10Ω (R9)
A6	-	D+	PA12 via 10Ω (R7)
A7	-	D-	PA11 via 10Ω (R9)
B6	-	D+	PA12 via 10Ω (R7)
A8	-	SBU1	Ground plane via 5.1kΩ (R8)
B5	-	CC2	Ground plane via 5.1kΩ (R8)
B4/A9	-	VBUS	+5V rail
B1/A12	-	GND	Ground plane

SWD header properties

SWD header pins

Name	SW
Reference	None
Type	pin header (2.54mm, 4x1, male)

#	Name	Function	Connected to
1	3.3V	VCC	+3.3V rail
2	SWDIO	SWDIO	PA13
3	SWCLK	SWCLK	PA14
4	GND	GND	Ground plane

Devices

Generic EEPROM properties *footprint*

Name	Unknown
Reference	U3
Manufacturer	Unknown
Part	Generic EEPROM
Marking	Unknown
Datasheet	Unavailable
Package	SOP 8 pins
Description	Generic I2C EEPROM

Generic EEPROM pins *footprint*

#	Name	Function	Connected to
1	-	/CS	PA4
2	-	DO	PB4
3	-	/WP	+3.3V rail
4	-	GND	Ground plane
5	-	DI	PA7
6	-	CLK	PA5
7	-	/HOLD	+3.3V rail
8	-	VCC	+3.3V rail

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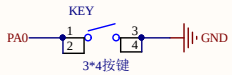
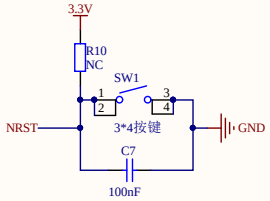
policy.

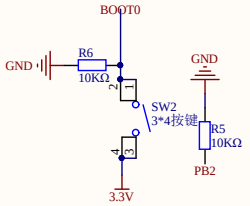


用户按键

V1.3 增加用户按键 KEY

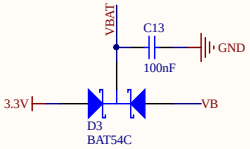


复位电路

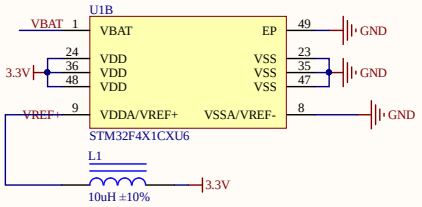


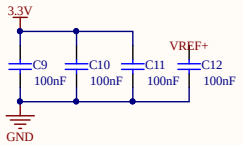
BOOT设置

V1.2 修改BOOT跳线为BOOT0按键，BOOT1 10K下拉

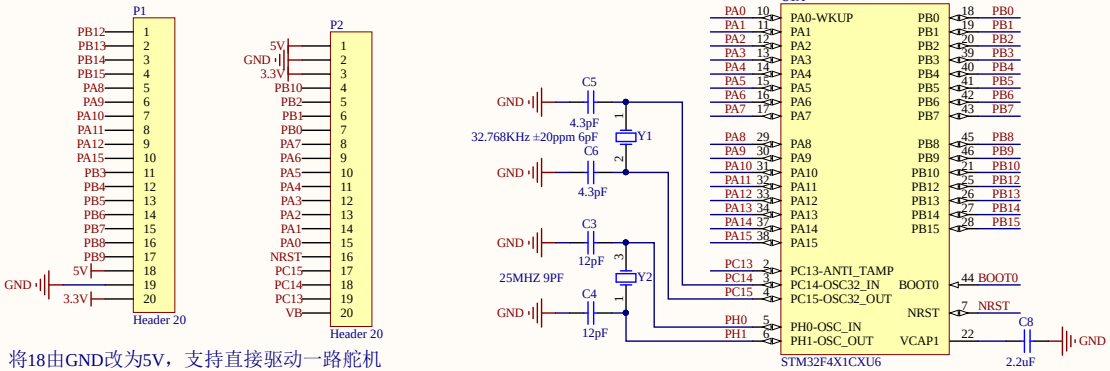


RTC电源

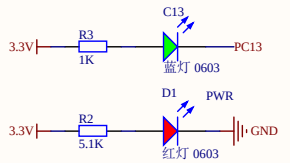




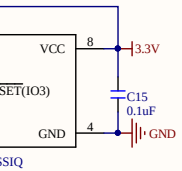
STM32电源部分

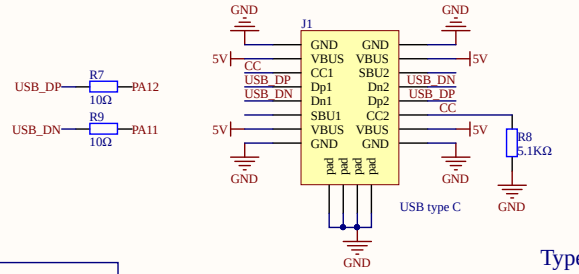


V1.1 将18由GND改为5V，支持直接驱动一路舵机



指示灯

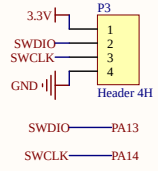




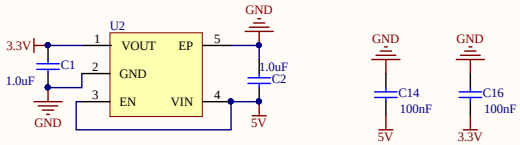
Type-C 接口

V2.0 MISO脚由PA6改为PB4,方便STM32F411用户同时连接TF卡和FLASH

FLASH 自行购买焊接



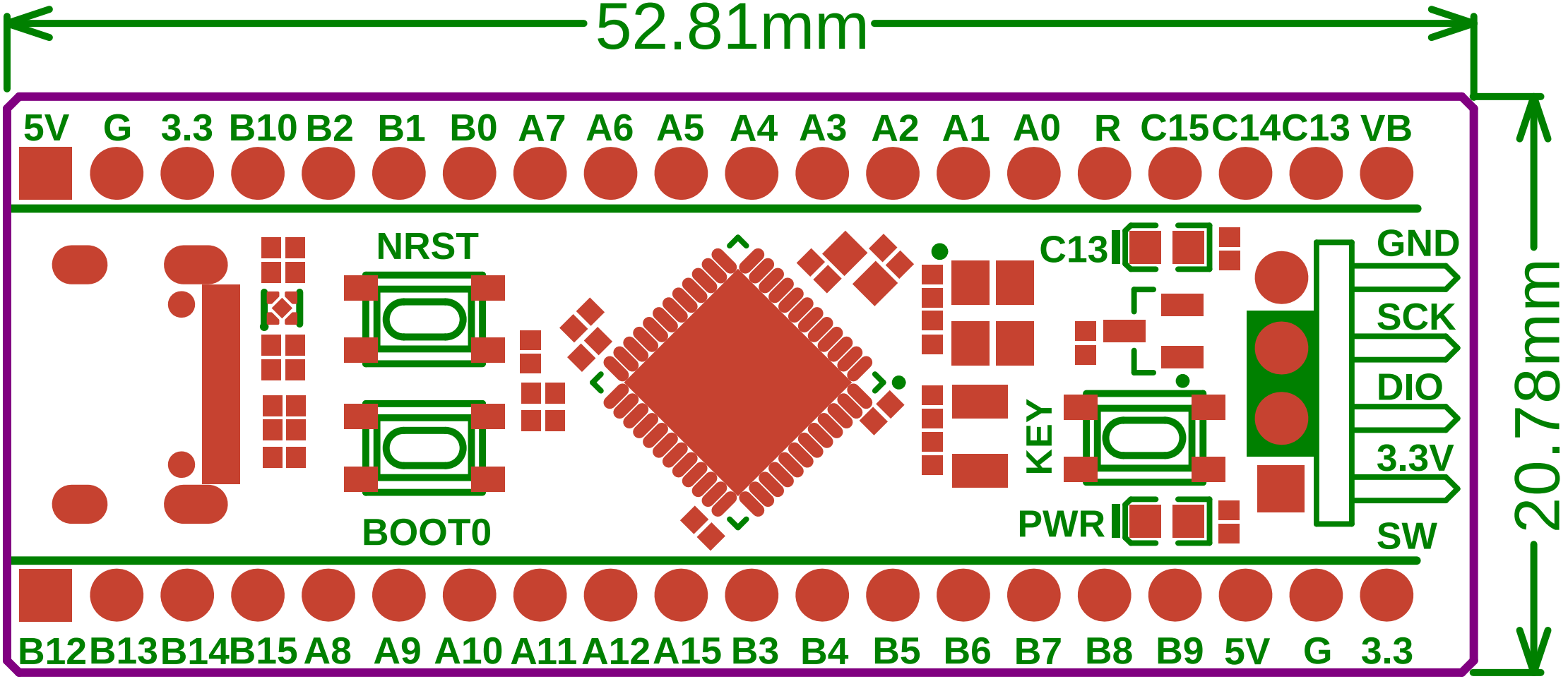
SW 调试下载接口



5V -> 3.3V 电源转换

WeAct

Title	MiniF4 Bottom有V2.0字样 V2.0	
Size A3	Number	Revision V2.0
Date: 2019/11/22/周五		Sheet of
File: E:\AD\..\MiniF4x1Cx.SchDoc		Drawn By: zhuyix


52.81mm
20.78mm
5V G 3.3 B10 B2 B1 B0 A7 A6 A5 A4 A3 A2 A1 A0 R C15 C14 C13 VB
NRST
BOOT0
C13
KEY
PWR
GND
SCK
DIO
3.3V
SW
B12 B13 B14 B15 A8 A9 A10 A11 A12 A15 B3 B4 B5 B6 B7 B8 B9 5V G 3.3