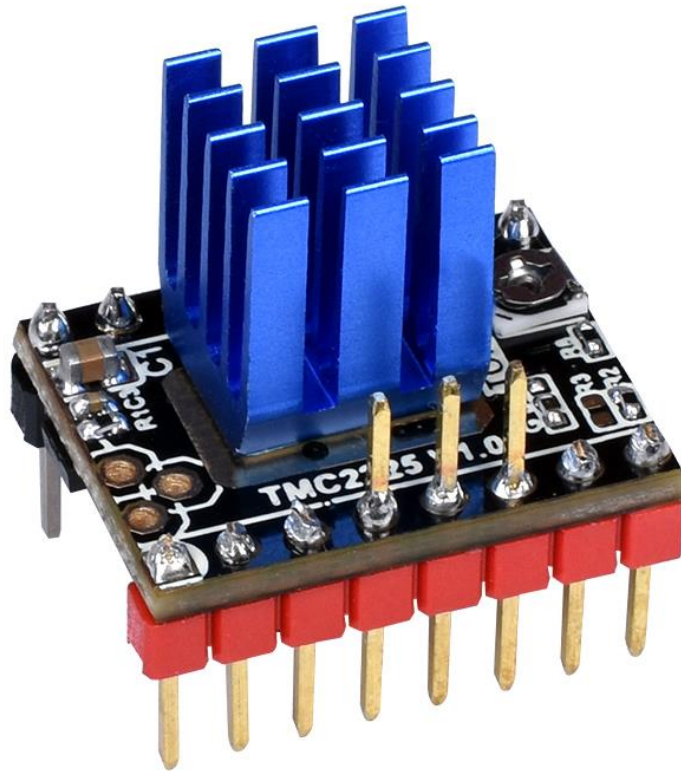


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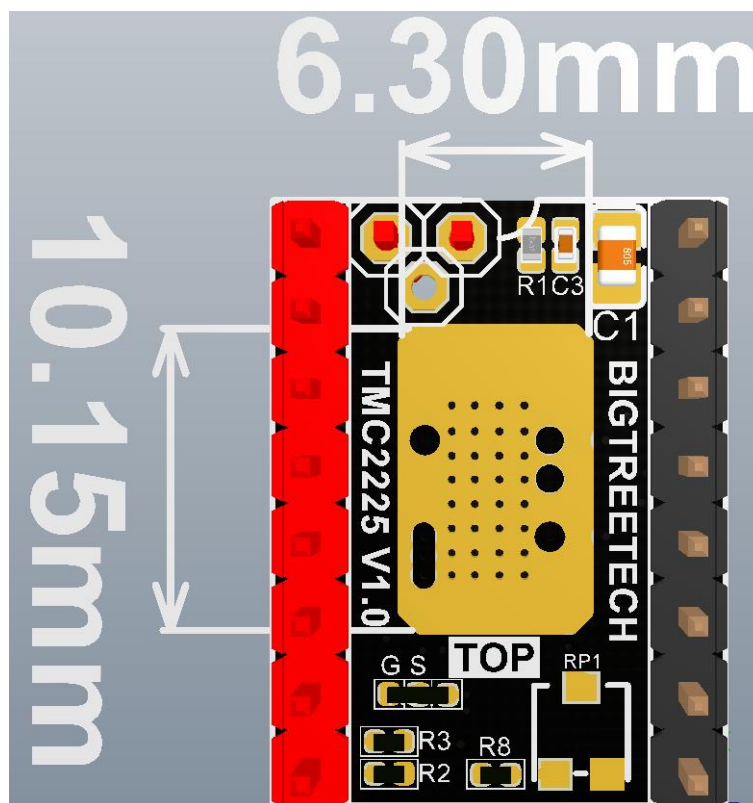
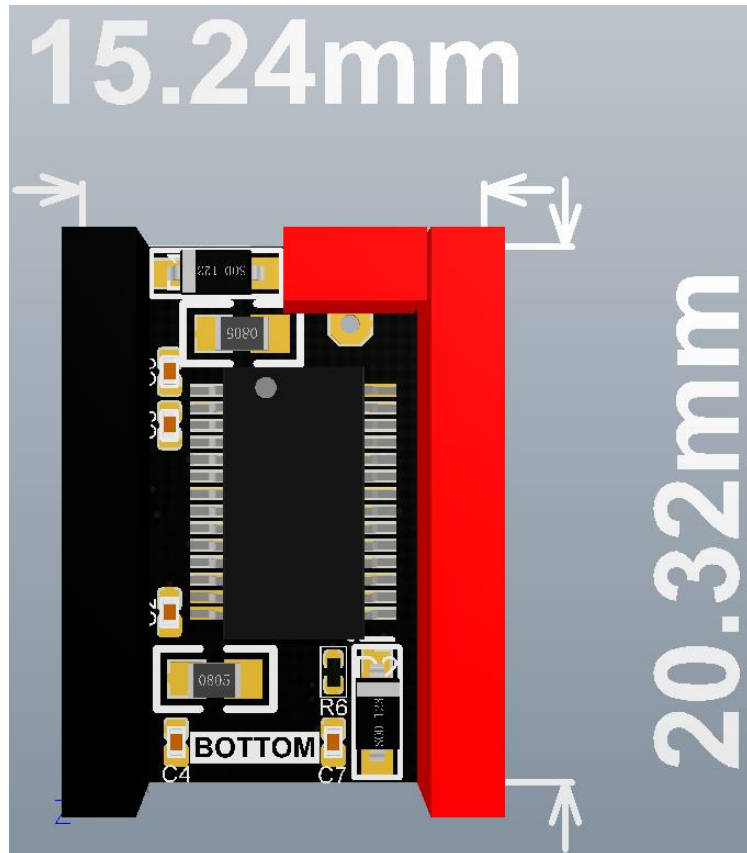
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TMC2225-V1.0

Stepper motor driver module



I. Size information

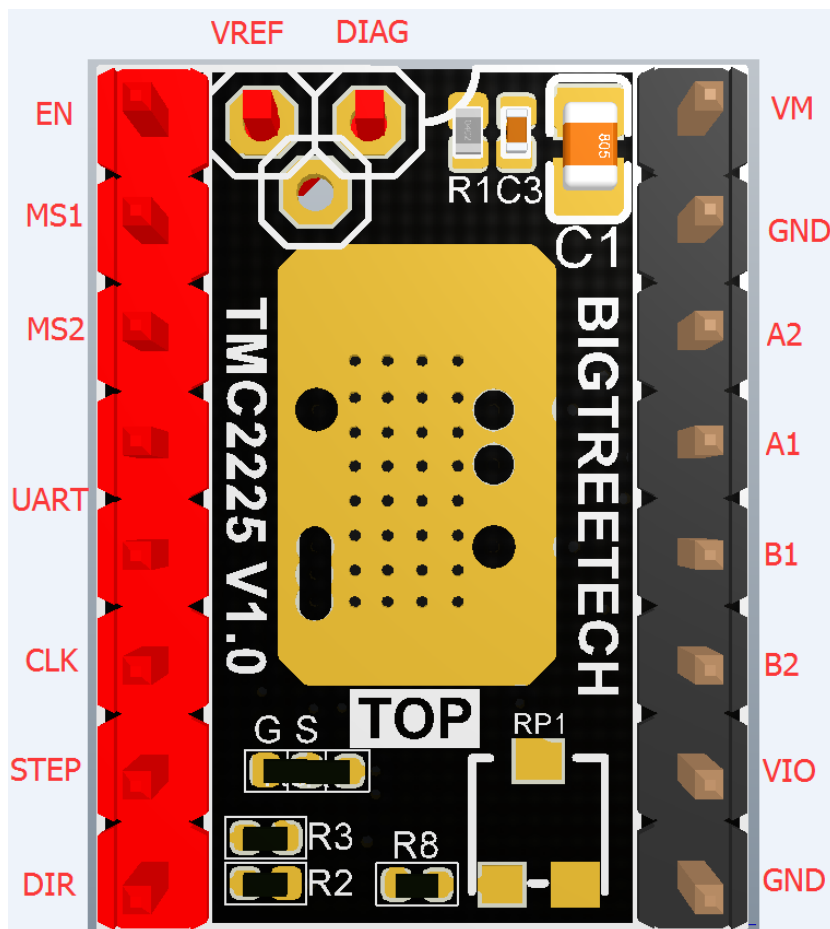


Parameter description

2-phase stepper motors up to 2A coil current (peak)
STEP/DIR Interface with 4, 8, 16 or 32 microstep pin setting
Smooth Running 256 microsteps by MicroPlyer interpolation
StealthChop2 silent motor operation
SpreadCycle highly dynamic motor control chopper
Low RDSon LS 280mΩ & HS 290mΩ (typ. at 25°C)
Voltage Range 4.75... 36V DC
Automatic Standby current reduction (option)
Internal Sense Resistor option (no sense resistors required)
Passive Braking and Freewheeling
Single Wire UART & OTP for advanced configuration options
Integrated Pulse Generator for standalone motion
Full Protection & Diagnostics
HTSSOP package for best thermal resistance

II. Working mode and Potentiometer

1. STEP/DIR mode:



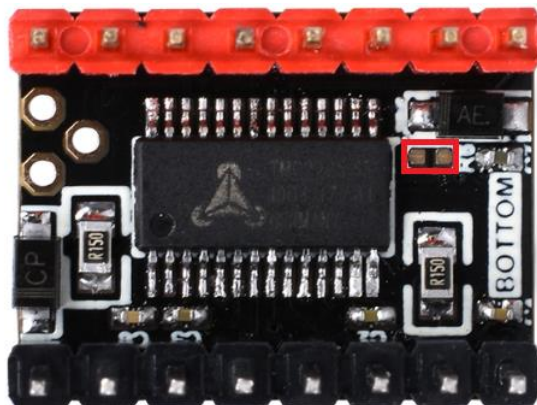
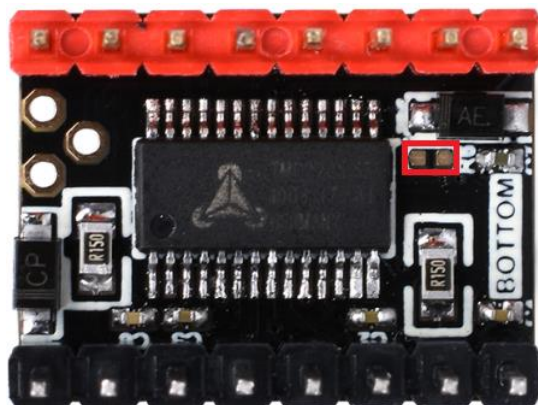
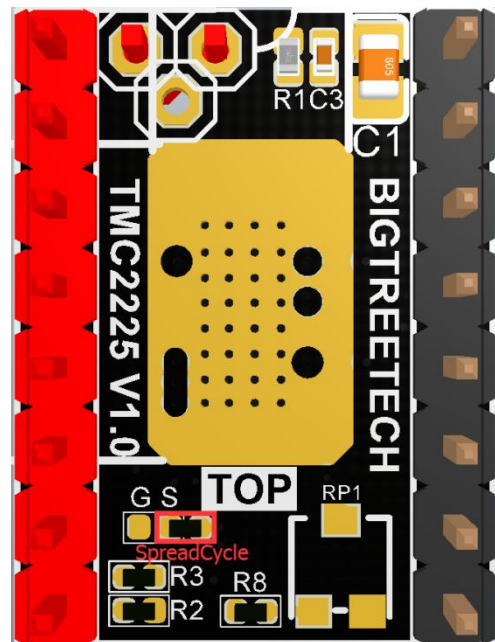
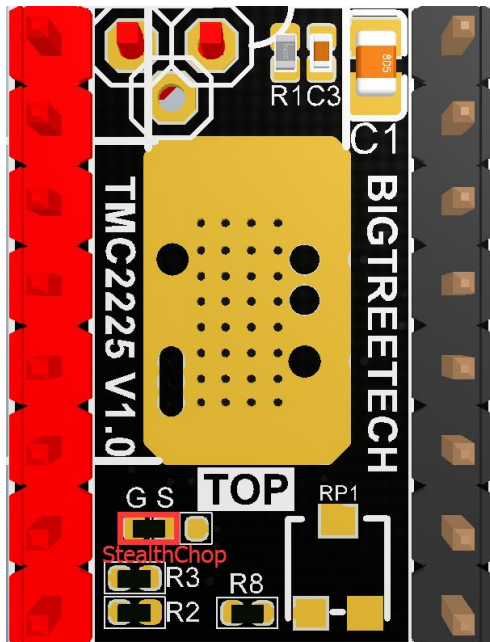
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Working mode choice: MS1、MS2:

MS1/MS2: CONFIGURATION OF MICROSTEP RESOLUTION FOR STEP INPUT		
MS2	MS1	Microstep Setting
GND	GND	4 microsteps (quarter step)
GND	VCC_IO	8 microsteps
VCC_IO	GND	16 microsteps
VCC_IO	VCC_IO	32 microsteps

Spread: The default spread setting is stealthChop mode, and users can change it as they like.

SPREAD: SELECTION OF CHOPPER MODE	
SPREAD	Chopper Setting
GND or Pin open / not available	StealthChop is selected. Automatic switching to SpreadCycle in dependence of the step frequency can be programmed via OTP.
VCC_IO	SpreadCycle operation.



picture 1

R6 resistance no need to weld, picture 1 default factory setting.

picture 2

If using 0R resistance welding R6, VM = 5VOUT

2.UART mode:

Benefits of UART mode:

Motor current can be set arbitrarily through the firmware;

Microsteps can be set arbitrarily through firmware (up to 256 actual microsteps);

Actual and interpolated microsteps can be combined to achieve maximum torque;

The firmware can dynamically switch the stealthChop2 and spreadCycle modes through UART.

When the motor is not moving, the motor standby current can be reduced dynamically (through UART).

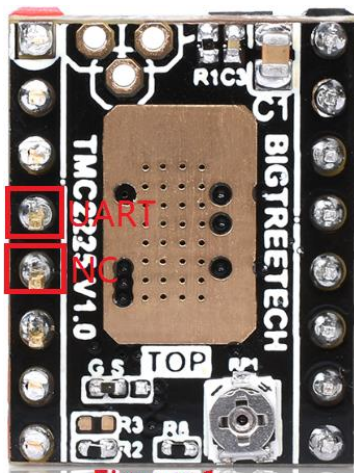


Figure 1

R3 resistance no need to weld,picture 1 default factory setting.

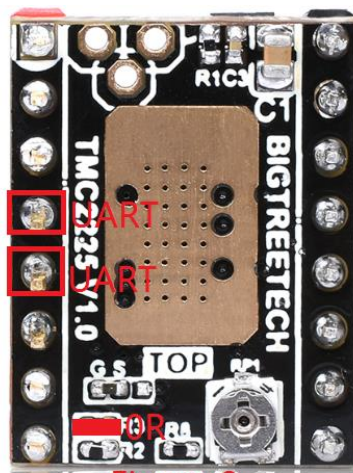


Figure 2

OR resistance is welded at R3 position or directly welded with solder, as shown in picture 2, both pin are UART interfaces.

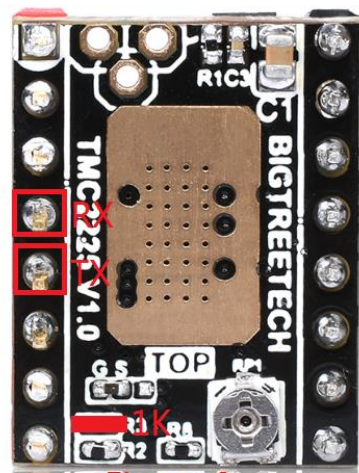
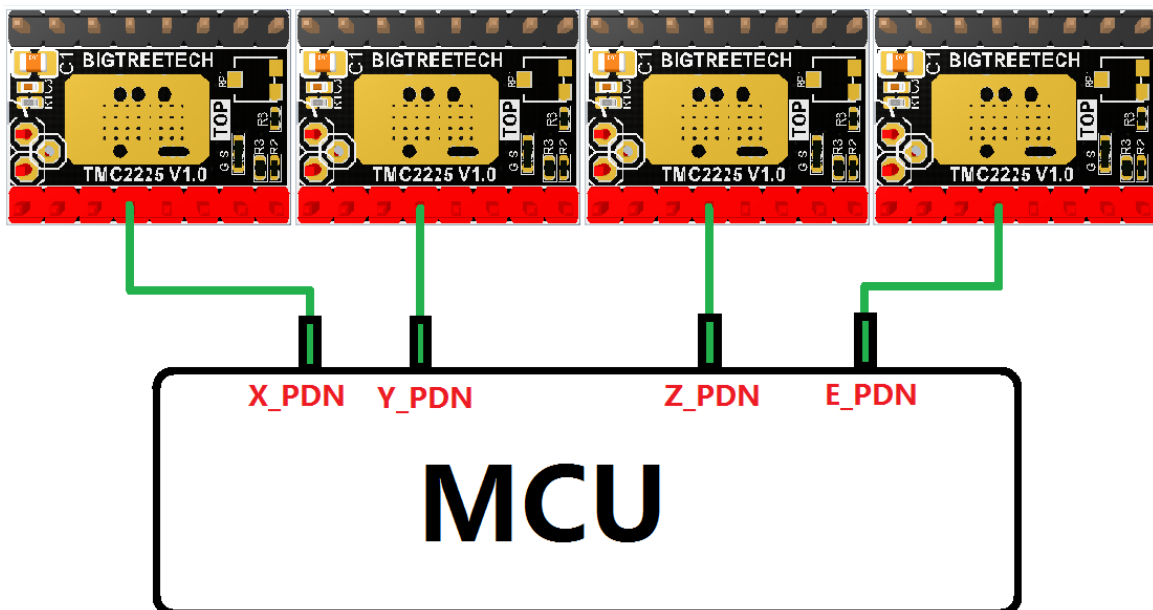


Figure 3

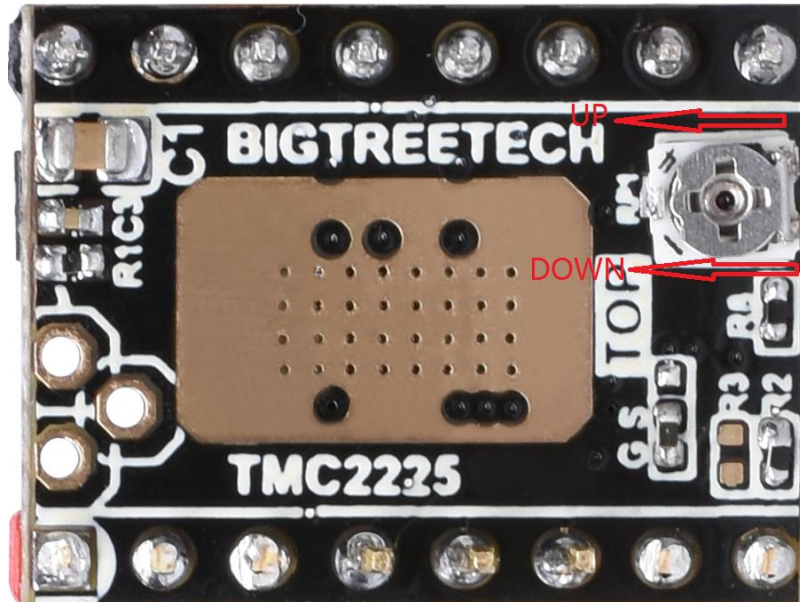
Welding 1K resistance at R3 position as shown in picture 3, two pins are RX pin and TX pin respectively.

Wiring diagram is as follows:



3.Potentiometer settings:

Clockwise Rotating Potentiometer - Reduce Vref, thereby reducing drive current;
Counterclockwise rotating potentiometer - Increase Vref, thereby increasing the driving current.



The accurate voltage of Vref can only be measured when the main board is supplied with 12V or 24V voltage.

Rotating potentiometer must not use too much force to prevent irreversible damage to the potentiometer; when the counter-clockwise rotation reaches the maximum, if it continues to rotate, it will become the minimum; similarly, when the clockwise rotation reaches the minimum, if it continues to rotate, it will become the maximum.

III. Firmware change instructions:

Firmware (Marlin-BUGFIX-2.0) :

Firmware with TMC2208 settings

The TMC2225 UART mode can be used by directly replacing TMC2225 on the motherboard using TMC2208 UART mode.

Configuration.h:

```
662 #define X_DRIVER_TYPE TMC2208
663 #define Y_DRIVER_TYPE TMC2208
664 #define Z_DRIVER_TYPE TMC2208
665 //#define X2_DRIVER_TYPE A4988
666 //#define Y2_DRIVER_TYPE A4988
667 //#define Z2_DRIVER_TYPE A4988
668 //#define Z3_DRIVER_TYPE A4988
669 #define E0_DRIVER_TYPE TMC2208
670 //#define E1_DRIVER_TYPE A4988
```

Configuration_adv.h:

Default settings: 16 microsteps, 800mA current

```
1736
1737 #if AXIS_IS_TMC(X)
1738 #define X_CURRENT 800 // (m
1739 #define X_MICROSTEPS 16 // 0.
1740 #define X_RSENSE 0.15
1741 #define X_CHAIN_POS 0 // 0
1742 #endif
```

*Use Trinamic Stealthchop mode.

*When disabled, Marlin uses spreadCycle step mode.

```
894 */
895 #define STEALTHCHOP_XY
896 #define STEALTHCHOP_Z
897 #define STEALTHCHOP_E
898
```

IV. Notes

1. When hardware chooses UART working mode, cautiously use soldering iron to prevent scalding hands. After treatment, carefully observe whether there is residual tin slag in the module. It must be cleaned up to prevent short circuit burning of the module.

2. Pay attention to the line sequence and IO port when wiring. If the wrong line is connected, the drive will not work.

3. When inserting drive into the main board, pay attention to see the direction of drive, can not insert backward, to prevent drive from burning.

4. Make sure to take action in heat dissipation (heat sink and heat dissipation fan) before the driver works.

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If you encounter problems in use, welcome to contact us, we will be answer to you ASAP. If you have any good comments or suggestions on our products, please tell us, we will carefully consider your comments or Suggestions. Thank you for choosing BIGTREETECH products, thank you!