

1. Features

Smaller size, 50mm×50mm×12.5mm

Built-in over-voltage, under-voltage, over-temperature protection circuits

All control signals are electrically isolated, fully compatible with 3-5V Voltage input

High-speed PWM isolated input, isolation bandwidth > 50MHz

Support full duty cycle input, can be separated from MCU to achieve

Direct control by external switch, limit switch can be connected in series

Drive operating voltage 6.5-28V, support 7-24V

Voltage grade DC brush motor

Each channel has a two-color indicator to indicate the direction of the motor



2. Application

Automated robot

Mechatronics

Equipment manufacturing

Scientific research and production

Electronic competition

3. Comprehensive description

The dual-channel DC brush motor driver is designed to drive low voltage

Current motor design, each channel has a continuous output of 12A current

Ability to drive DC motors with up to 290W electric power.

The timing of the device in the driver is highly optimized, allowing PWM input

The minimum input pulse width is as low as 2us, which fully guarantees the dynamics of PWM

The adjustment range improves the control quality of the motor. Onboard warranty

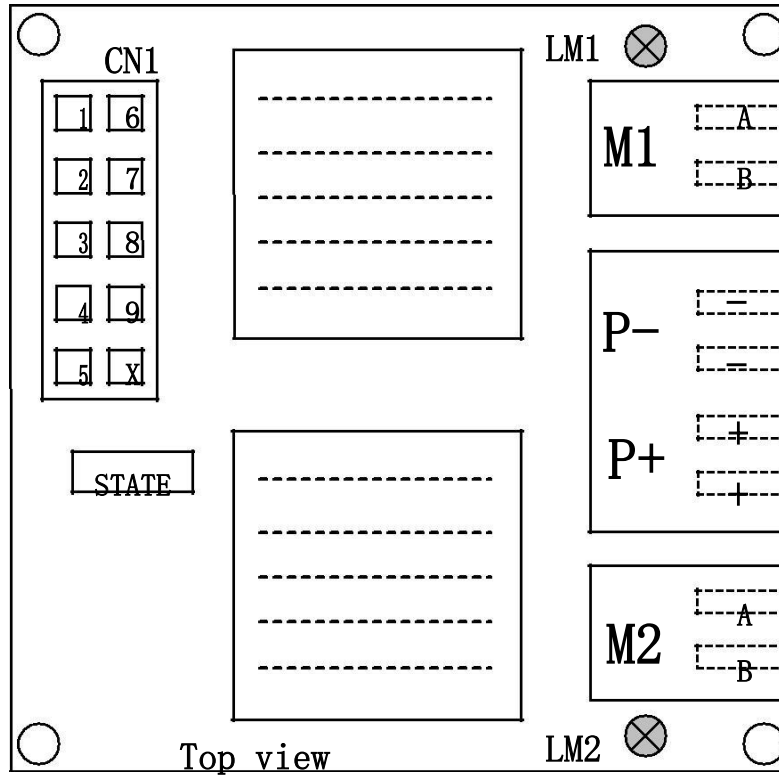
Protect the circuit, reduce the damage of the driver under abnormal working conditions

It is possible that the protection status is output in real time by the indicator light. Full power

The gas-isolated input enhances the safety of the main control MCU circuit,

It can significantly improve the electromagnetic compatibility performance of the system.

4. Pins and indicators



		Control input interface
CN1	definition	description
1	VCC	Isolated positive power input, compatible with 3.3V, 5V power supply
2	PWM1	channel duty cycle modulation input, high-speed isolation, bandwidth 50MHz
3	INA1	channel control logic input A
4	INB1	channel control logic input B
5	GND	Isolated power ground input
6	VCC	Isolated positive power input, compatible with 3.3V, 5V power supply
7	PWM2	channel duty cycle modulation input, high-speed isolation, bandwidth 50MHz
8	INA2	channel control logic input A
9	INB2	M2 channel control logic input B
X	GND	Isolated power ground input

Note:

1. The input signal is high when it is floating.
2. Control input terminal CN1 is 2.54mm pitch 2x5 double-row pin.

Power interface	
Terminal	definition
M1_A	Output pin A of motor channel 1
M1_B	Motor channel 1 output pin B
M2_A	Motor channel 2 output pin A
M2_B	Motor channel 2 output pin B
P-	Power supply negative input
P+	Power supply positive input

Indicator light			
Indicator light		State description	
STATE	Operating status means Beacon	Chang Liang	normal operation
		Flash	Power supply overvoltage, output off
		Slow flash	Power supply is under voltage, output is off
		Double flash	Drive overheated, output is off
LM1	Motor channel 1 turn indication, blue forward, red reverse		
LM2	Motor channel 2 turn indicator, blue forward, red reverse		

5. Operation logic

Run logic					
signal input				Power output	
INAx	INBx	PWMx	Mx_A	Mx_B	Motor status
L	L	X	L	L	brake
L	H	PWM	PWM	L	Forward
H	L	PWM	L	PWM	Reverse
H	H	X	Z	Z	Offline
The driver has over-voltage protection, under-temperature protection			Z	Z	Offline

Note:

- 1) In INAx, INBx, PWMx, Mx_A, Mx_B, x is the channel number, which can be 1 or 2.
- 2) H is high level, L is low level, X is level independent, Z is high impedance state.
- 3) When performing high-energy forward and reverse switching, PWM should be gradually adjusted to 0% before switching, otherwise the driver may be damaged.
- 4) Note: the input signal is high when it is floating

6. Working parameters

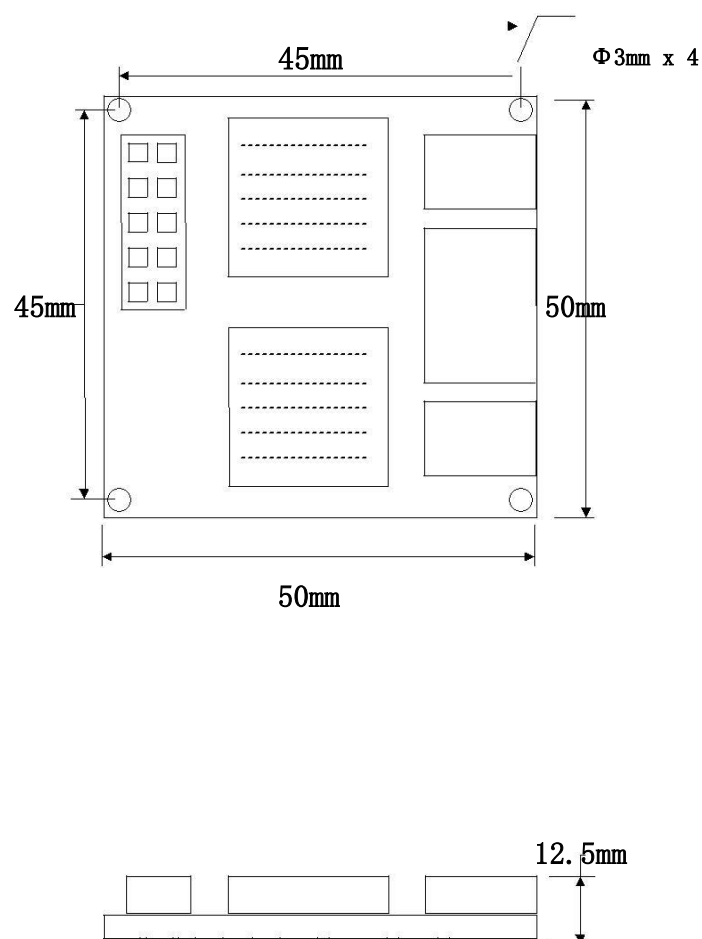
Working parameter					
Parameter item	condition	Minimum value	Typical value	Maximum	unit
Power supply voltage VP		6.5		28	V
Overvoltage protection value			28.5		V
Undervoltage protection value			6.3		V
Power supply current IP	Double terminal wiring			24	A
Single channel continuous output current Imc	VP=24V Resistive load			12	A
Single channel peak output current Imp	VP=24V t = 100ms			70	A
Single channel peak output current Imp	VP=24V t = 10us			200	A
Logic input voltage Vin	Same as logic signal amplitude	3		5.5	V
Logic input current Iin	VCC=5V		15		mA
PWM Input frequency			18	60	kHz
PWM Minimum pulse width	Positive and negative pulse		2		uS
Overheating protection	Sensor location	85		95	℃
Operating temperature		-25		85	℃

Note: 1. Except for special instructions, the test of this driver is carried out in an open environment at 20 ℃.

2. The two-terminal wiring is connected to two power lines of P + and P- terminals (because of the limited terminal capacity).

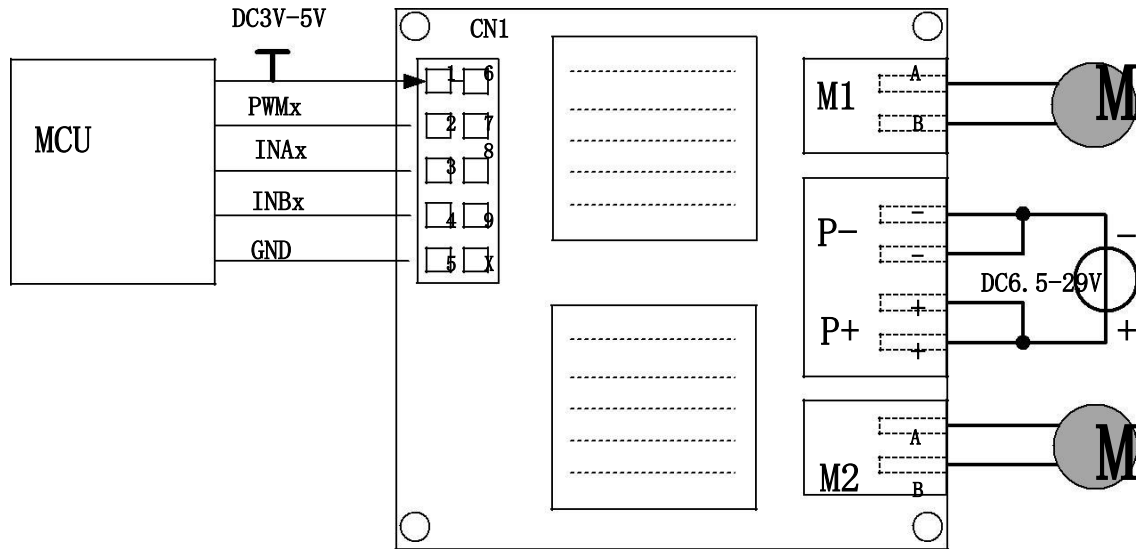
3. The PWM input frequency is recommended to be higher than 10kHz. When it is lower than this value, there may be significant current noise. The mute application should be set around 17-18kHz.

7. Structural parameters

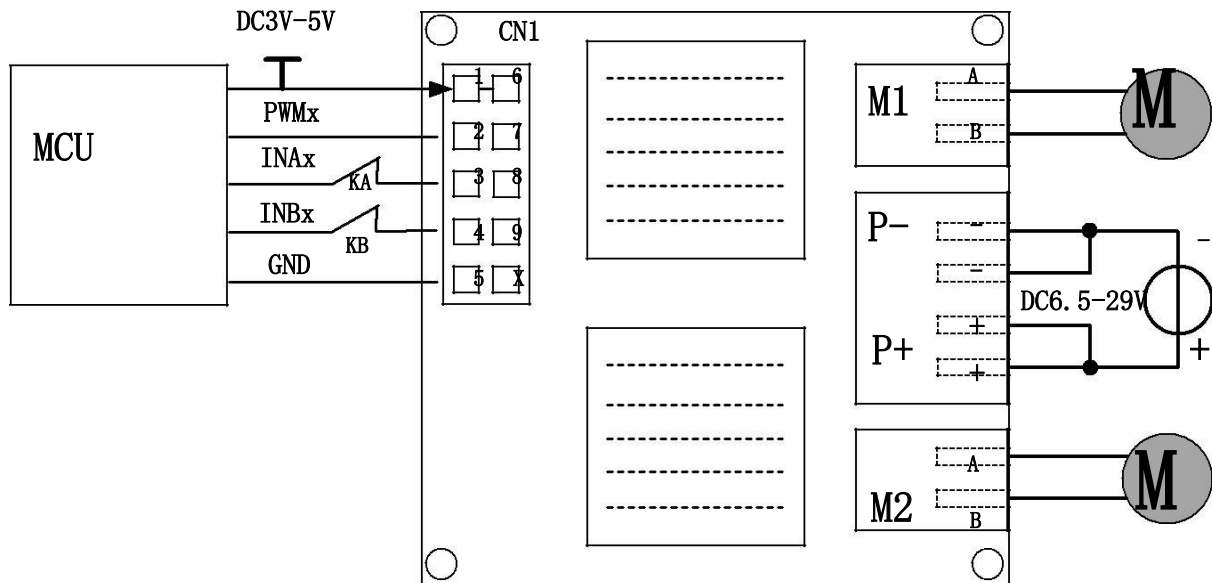


Note: The height of 12.5mm is included in the total height of the power terminal block. If the power terminal plug is considered, the total height is 15mm

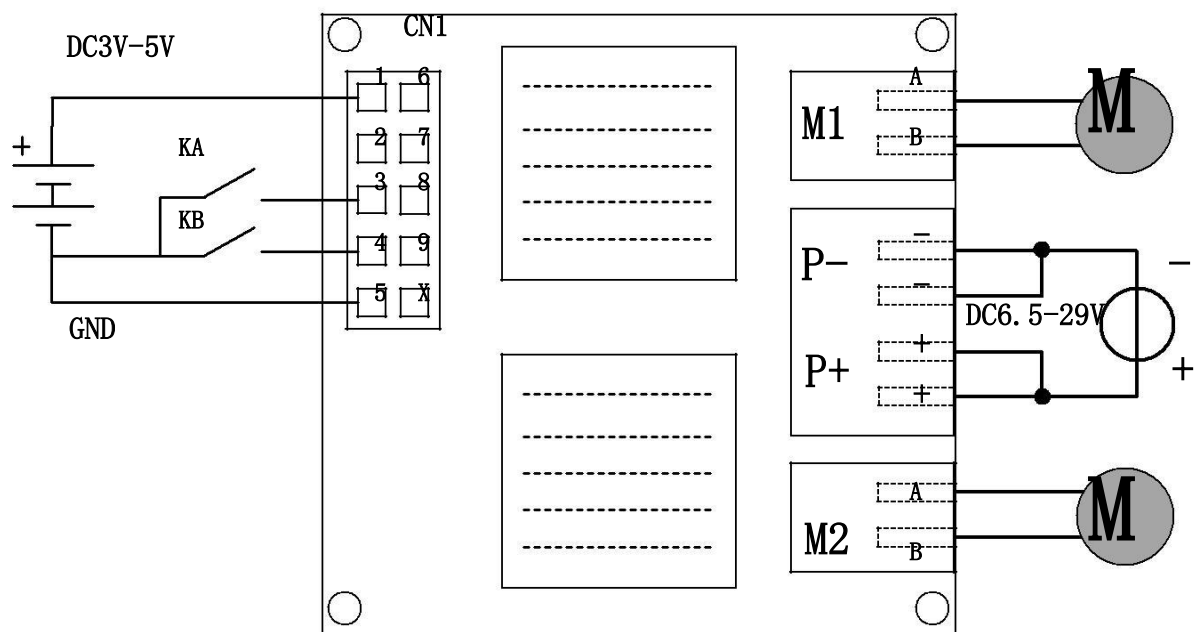
7. Typical applications



Use an MCU to directly control the motor operation



Application 2 MCU controls motor operation, adding limit switch function (KA, KB are limit normally closed contacts)



Use three buttons (KA, KB) to control the motor forward and reverse, without MCU participation

Note: 1. When the power input is greater than 12A, the power terminals must use double-ended wiring.

2. In order to avoid the destruction of short circuit surge current, fuse protection should be added to the power input and output circuits.

1. The driver power supply must not be reversed or overvoltage.

2. The power supply capacity should be large enough to avoid the voltage sag caused by the motor power fluctuations triggering the driver protection and the motor stalling.

3. The motor interface must not be short-circuited, otherwise the driver may be seriously damaged, and the fuse should be connected in series at the power supply end and the motor end for protection.

4. For closed or high temperature environments, the drive load should be appropriately reduced.

5. For loads with frequent high-power shocks, the driver should be derated appropriately according to the shock amplitude.

6. The thermal protection of the driver is affected by the heat transfer speed and has a certain delay. Therefore, rapid high-power thermal shock should be avoided.

7. The driver should not be damp, avoid short circuit of the components on the driver board, and do not touch the pins and pads of the components on the board with your hands.
8. In the event of a drive failure, the user must not repair or replace accessories without permission.
9. This manual will be updated according to the actual situation without prior notice.
10. Please read this manual carefully and use this driver correctly.
11. The VCC power input voltage of the control interface must be the same as the control signal amplitude, otherwise logic errors may occur.
12. The logic control interface VCC and each control signal voltage must not exceed the range shown in the manual.

11. Technical tips

1. When the PWM duty cycle of the driver is reduced, the motor energy will flow to the power supply. If it is a switching power supply, overvoltage protection will be generated. If the protection occurs repeatedly, it will damage the life of the drive module. In this case, regenerative energy suppression measures should be added, or the sudden change of the PWM duty cycle should be smoothed.