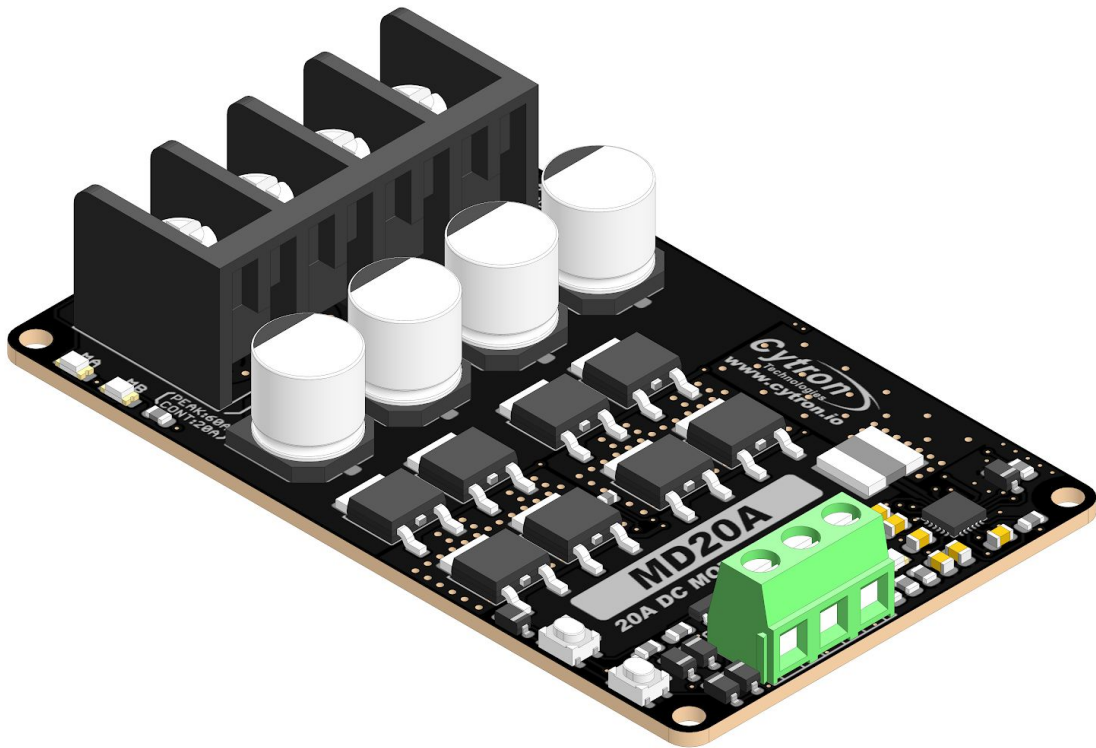




MD20A

20Amp 6V-30V DC Motor Driver



Datasheet

Rev 1.0
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1. BOARD LAYOUT & FUNCTION

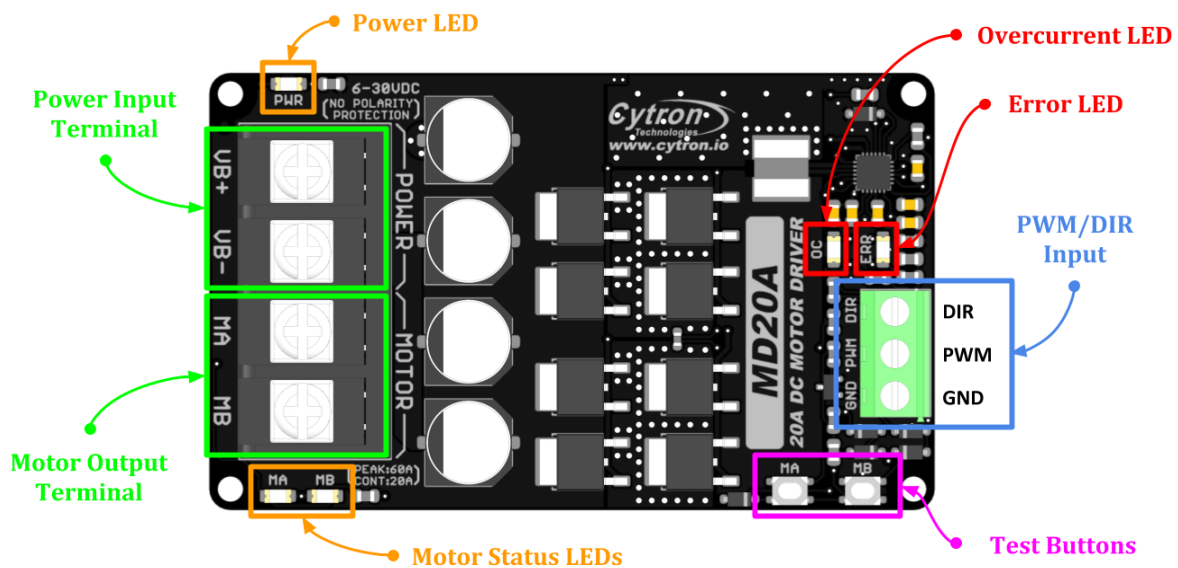


Figure 1: MD20A Board Functions

| Function | Description |
|------------------------------|--|
| Power Input Terminal | Connect to battery. <ul style="list-style-type: none"> VB+ : Positive VB- : Negative <i>Warning : Connecting in reverse polarity will damage the motor driver instantaneously.</i> |
| Motor Output Terminal | Connect to motor terminal. Motor direction is depending on the polarity. |
| Power LED | Turn on when power up. |
| Motor Status LEDs | Turn on when the motor is running. <ul style="list-style-type: none"> MA : Forward* MB : Backward* |
| Error LED | Turn on during undervoltage shutdown or hardware fault. Please contact support@cytron.io for more information. |
| OC (Overcurrent) LED | Turn on when current limiting is in action. Current limit threshold is depending on the board temperature. |
| Test Buttons | Press to test the functionality of the motor driver. Motor will run at full speed. <ul style="list-style-type: none"> MA : Forward* MB : Backward* |
| PWM/DIR Input | Control the motor with PWM & DIR signal. <ul style="list-style-type: none"> DIR : Direction input. PWM : PWM input for motor speed control. GND : Signal ground. |

Table 1: MD20A Board Functions

* Actual motor direction is depending on the motor connection.
Swapping the connection (MA & MB) will reverse the direction.

2. SPECIFICATIONS

| No | Parameters | | Min | Max | Unit |
|----|--|------------------------|-----|-----|------|
| 1 | Power Input Voltage | | 6 | 30 | V |
| 2 | Maximum Motor Current | Continuous | - | 20 | A |
| | | Peak ^{*1} | - | 60 | A |
| 3 | Logic Input Voltage (PWM & DIR) | Low Level | 0 | 0.8 | V |
| | | High Level | 1.5 | 15 | V |
| 4 | PWM Frequency (Output frequency is same as input frequency) | Standard | DC | 20 | KHz |
| | | Extended ^{*2} | 20 | 40 | KHz |

Table 2: MD20A Absolute Maximum Ratings

^{*1} Peak current is limited by the overcurrent protection circuit. Actual current limit is depending on board temperature. Value shown is at room temperature (25 - 30 degree Celsius).

^{*2} When the PWM operates in extended frequency range, continuous motor current will be reduced.

3. DIMENSION

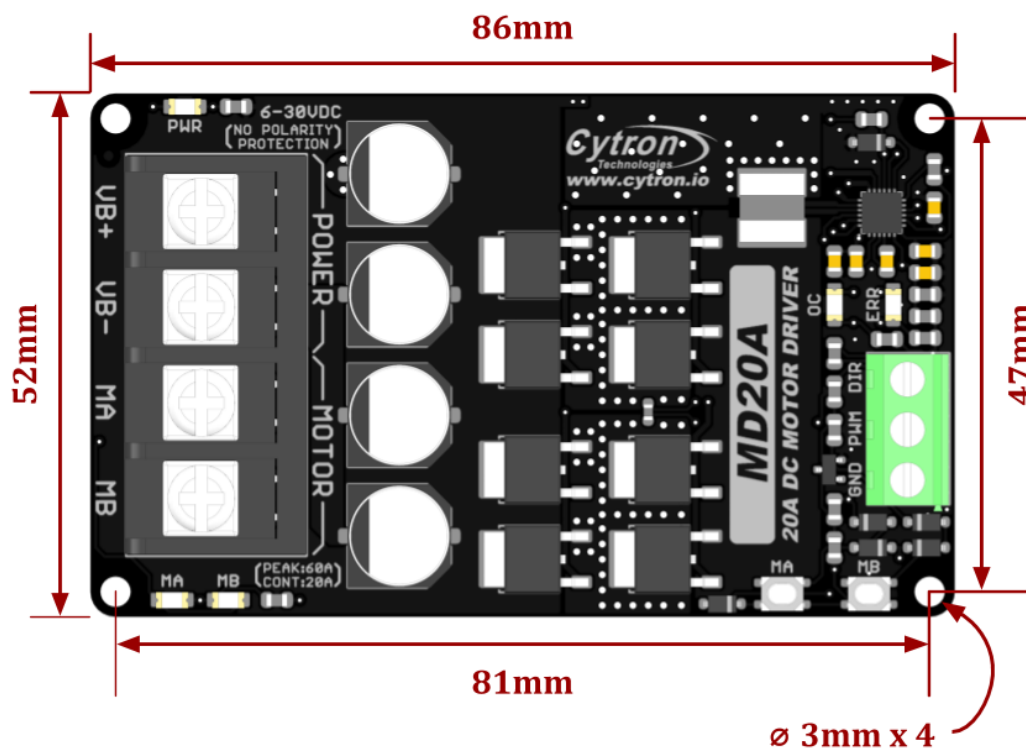


Figure 2: MD20A Dimension

4. INTERFACE

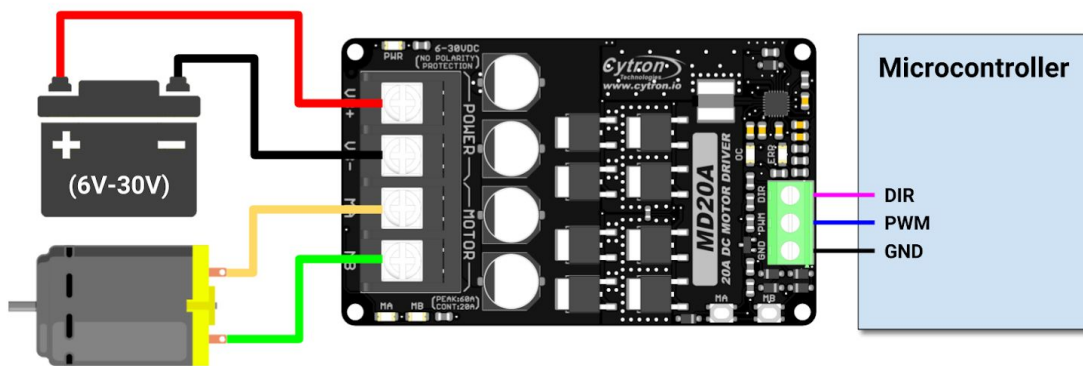


Figure 3: PWM & DIR Input Connection Diagram

| PWM | DIR | Output A (MA) | Output B (MB) | Motor |
|------|----------------|---------------|---------------|-----------|
| Low | X (Don't Care) | Low | Low | Brake |
| High | Low | High | Low | Forward* |
| High | High | Low | High | Backward* |

Table 3: PWM/DIR Input Truth Table

* Actual motor direction is depending on the motor connection.
Swapping the connection (MA & MB) will reverse the direction.

5. PROTECTION FEATURES

- **Overcurrent Protection with Active Current Limiting**

When the motor is trying to draw more current than what the motor driver can supply, the PWM to the motor will be chopped off and the motor current will be maintained at maximum current limit. This prevents the motor driver from damage when the motor stalls or an oversized motor is hooked up. OC LED will turn on when current limiting is in action.

- **Temperature Protection**

The maximum current limiting threshold is determined by the board temperature. The higher the board temperature, the lower the current limiting threshold. This way, MD20A is able to deliver its full potential depending on the actual condition without damaging the MOSFETs.

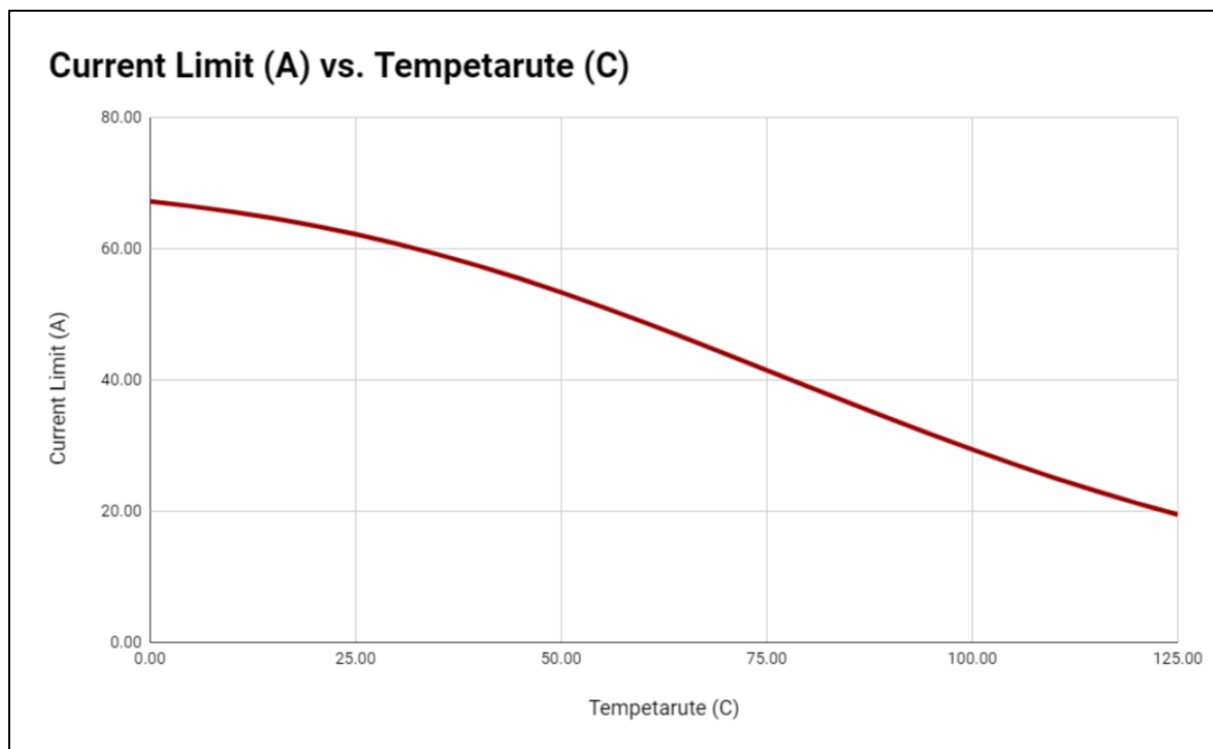


Figure 4: Maximum Current Limit vs Temperature Graph

- **Undervoltage Shutdown**

The motor driver output will be shut down when the power input voltage drops below the lower limit. This is to make sure the MOSFETs have sufficient voltage to fully turn on and do not overheat. ERR LED will turn on during undervoltage shutdown.

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