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## TB6600 1 axis Stepper Motor 2-phase Driver Board for CNC Router

Product 5/5

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TO ANYWHERE ON THE PLANET  
ON ORDERS OVER \$100

- Model: HY-TB6600-Module
- Shipping Weight: 120g
- 404 Units in Stock

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## PWM Chopper-Type bipolar Stepping Motor Driver IC

The TB6600HQ is a PWM chopper-type single-chip bipolar sinusoidal micro-step stepping motor driver. Forward and reverse rotation control is available with 2-phase, 1-2-phase, W1-2-phase, 2W1-2-phase, and 4W1-2-phase excitation modes. 2-phase bipolar-type stepping motor can be driven by only clock signal with low vibration and high efficiency.

## TB6600 Features

1. Single-chip bipolar sinusoidal micro-step stepping motor driver
2. BiCD 0.13 (50 V) process
3.  $R_{on}$  (upper + lower) = 0.4  $\Omega$  (typ.)
4. Forward and reverse rotation control available
5. Selectable phase drive (1/1, 1/2, 1/4, 1/8, and 1/16 step)
6. Output withstand voltage: VCC = 50 V
7. Output current: IOUT = 5.0 A (absolute maximum ratings, peak, within 100ms) IOUT = 4.5 A (operating range, maximal value)
8. Packages: HZIP25-1.00F
9. Built-in input pull-down resistance: 100 k $\Omega$  (typ.)
10. Output monitor pins (ALERT): Maximum of IALERT = 1 mA
11. Output monitor pins (MO): Maximum of IMO = 1 mA
12. Equipped with reset and enable pins
13. Stand by function
14. Single power supply
15. Built-in thermal shutdown (TSD) circuit
16. Built-in under voltage lock out (UVLO) circuit
17. Built-in over-current detection (ISD) circuit

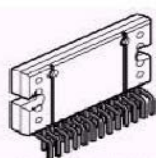
## TB6600 VS TB6560

**TB6600HQ vs. TB6560AHQ Comparison of specifications**

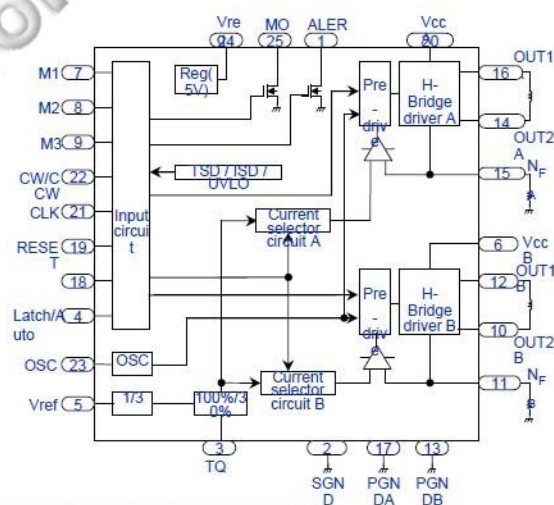
	<b>TB6600HQ</b>	<b>TB6560AHQ</b>
Process	BiCD0.13 50 V	BiCD0.6 40 V
Power supply voltage	V <sub>CC</sub> = 8.0 to 45.0 V (single power supply)	V <sub>DD</sub> = 4.5 to 5.5 V, V <sub>M</sub> = 4.5 to 34.0 V
Output current (peak)	5.0 A	3.5 A
ON resistance (upper + lower)	0.4 Ω	0.6 Ω
Excitation mode	1/1, 1/2, 1/4, 1/8, and 1/16	1/1, 1/2, 1/8, and 1/16
CLK frequency	Up to 200 kHz	Up to 15 kHz
Minimum of clock pulse width	2.2 μs	10 μs
OSC frequency	4000 kHz	Up to 600 kHz
Chopping frequency	20 kHz to 60 kHz	Up to 150 kHz
Decay mode	○ (40 %)	○ (100 %, 50 %, 25 %, and 0 %)
Protection	①TSD ②ISD ③UVLO	Only TSD
Torque	V <sub>ref</sub> and TQ pins (100 %, 30 %)	TQ pin (100 %, 75 %, 50 %, and 20 %)
Package	HZIP25-P-1.00F	HZIP25-P-1.27

**TB6600HQ**☑ **50V / 5.0A****4W1-2 phase Excitation Bipolar Stepper Motor Driver :**

- **Easy to control by CLK input !**
- **High current : 5.0A/phase**
- **4bit micro stepped.**

**Under Development****ES:Sep.2011 CS:March,2012****TB6600HQ**  
HZIP25-P-1.00F**<Features>**

- ☑ 4W1-2
- ☑ Mix-decay mode
- ☑ TSD, ISD, UVLO
- ☑ Ron (H+L)=0.4ohm
- ☑ Ta=-30 to 85°C

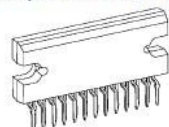
**2 phase****1-2 phase****W1-2 phase****2W1-2 phase****4W1-2 phase**

**TB6560AHQ/AFG/AFTG****☑40V / 3.5A (AHQ), 2.5A (AFG)****4W1-2 phase Excitation Bipolar Stepper Motor Driver :**

- Easy to control by **CLK input !**
- High current : **3.5A/phase (AHQ)**.
- **4bit micro stepped.**

**In MP**

**TB6560AFG**  
THQFP64-P-10101-0.5



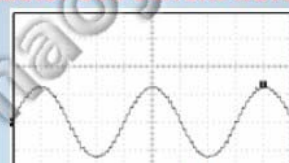
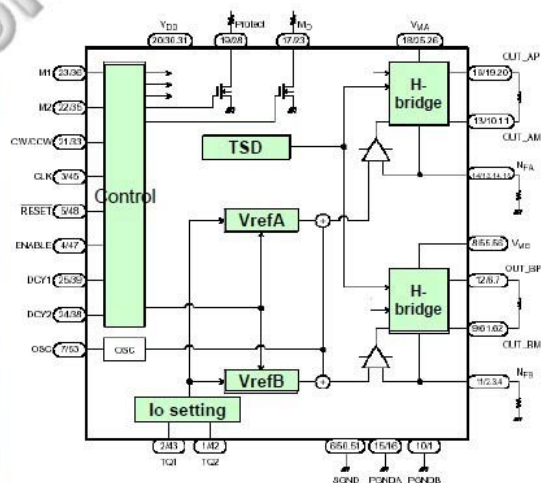
**TB6560AHQ**  
HZIP25-1.27



**TB6560AFTG**  
QFN48-P-0707-0.50

**<Features>**

- ☑ Mix-decay mode
- ☑ TSD
- ☑ Ron (H+L)=0.6ohm
- ☑ Ta=-30 to 85°C

**<Motor coil current wave>****Io (peak)=2.5A, fCLK=400Hz****2 phase****1-2 phase****W1-2 phase****4W1-2 phase**

## Overview

The module working voltage is 12~48V. it can used to drive a stepper motor. The stepper motor is suitable for 4.5A 2-phase model.

### 1. Excitation Settings

The excitation mode can be selected from the following eight modes using the M1, M2 and M3 inputs. New excitation mode starts from the initial mode when M1, M2, or M3 inputs are shifted during motor operation. In this case, output current waveform may not continue.

INPUT			Mode(Excitation)
M1	M2	M3	
OFF	OFF	OFF	Standby mode (Operation of the internal circuit is almost turned off.)
OFF	OFF	ON	1/1 (2-phase excitation, full-step)
OFF	ON	OFF	1/2A type (1-2 phase excitation A type) ( 0% - 71% - 100% )
OFF	ON	ON	1/2B type (1-2 phase excitation B type) ( 0% - 100% )
ON	OFF	OFF	1/4 (W1-2 phase excitation)
ON	OFF	ON	1/8 (2W1-2 phase excitation)
ON	ON	OFF	1/16 (4W1-2 phase excitation)
ON	ON	ON	Standby mode (Operation of the internal circuit is almost turned off.)

Note: To change the exciting mode by changing M1, M2, and M3, make sure not to set M1 = M2 = M3 = L or M1 = M2 = M3 = H.



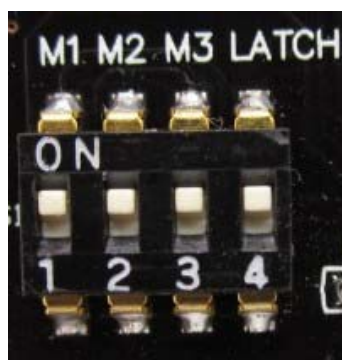
## Standby mode

The operation mode moves to the standby mode under the condition  $M1 = M2 = M3 = L$  or  $M1 = M2 = M3 = H$ . The power consumption is minimized by turning off all the operations except protecting operation. In standby mode, output terminal MO is HZ. To release the standby mode, release the condition of  $M1 = M2 = M3 = L$  or  $M1 = M2 = M3 = H$ . Input signal is not accepted for about 200  $\mu s$  after releasing the standby mode.

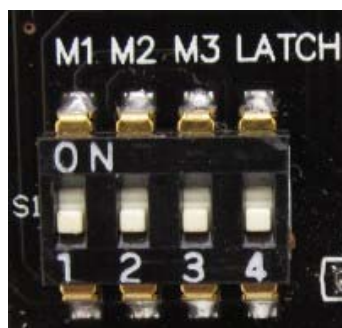
## 2. LATCH Settings

INPUT	Mode(Excitation)
Latch/Auto	
ON	Automatic return
OFF	Latch

Note: Latch/Auto mean Select a return type for thermal shutdown (TSD) circuit and over-current detection (ISD) circuit., when TSD or ISD is happen, the WARN led will work.

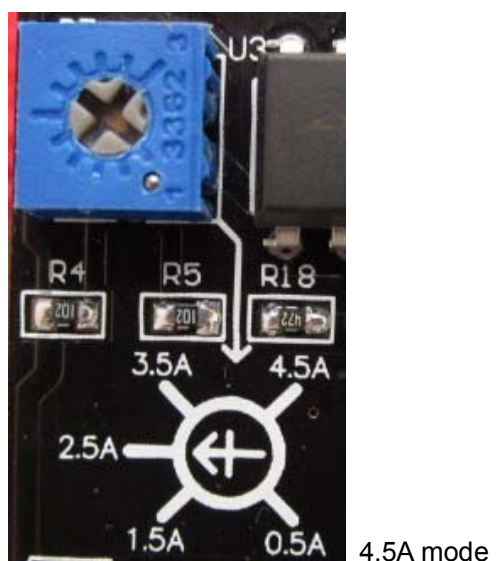
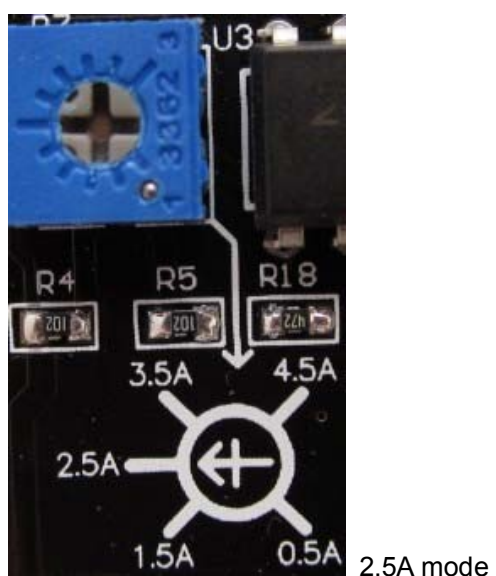


M1 = M2 = M3 = LATCH = ON



M1 = M2 = M3 = LATCH = OFF

## 3. Output current mode



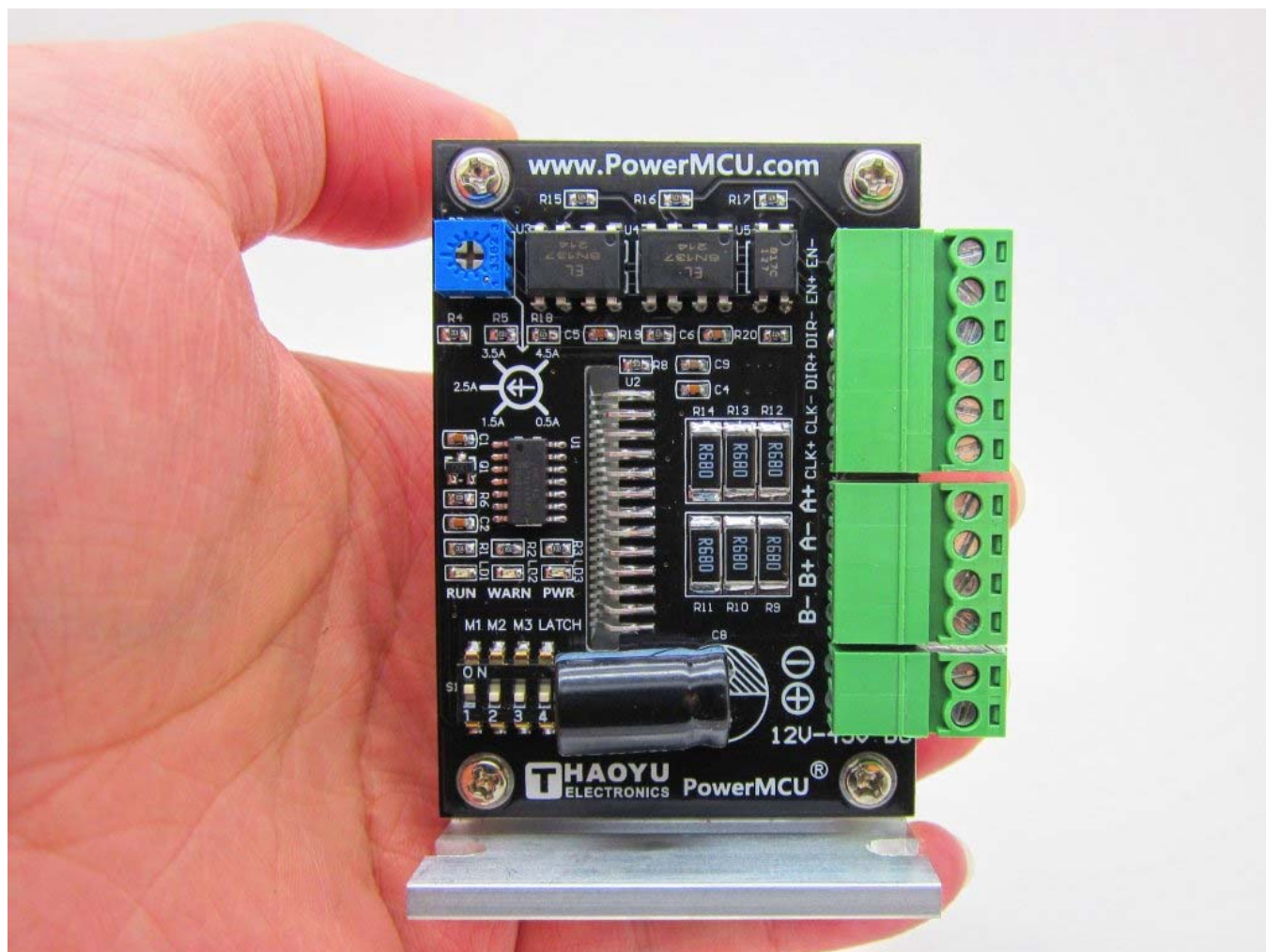
## Warning

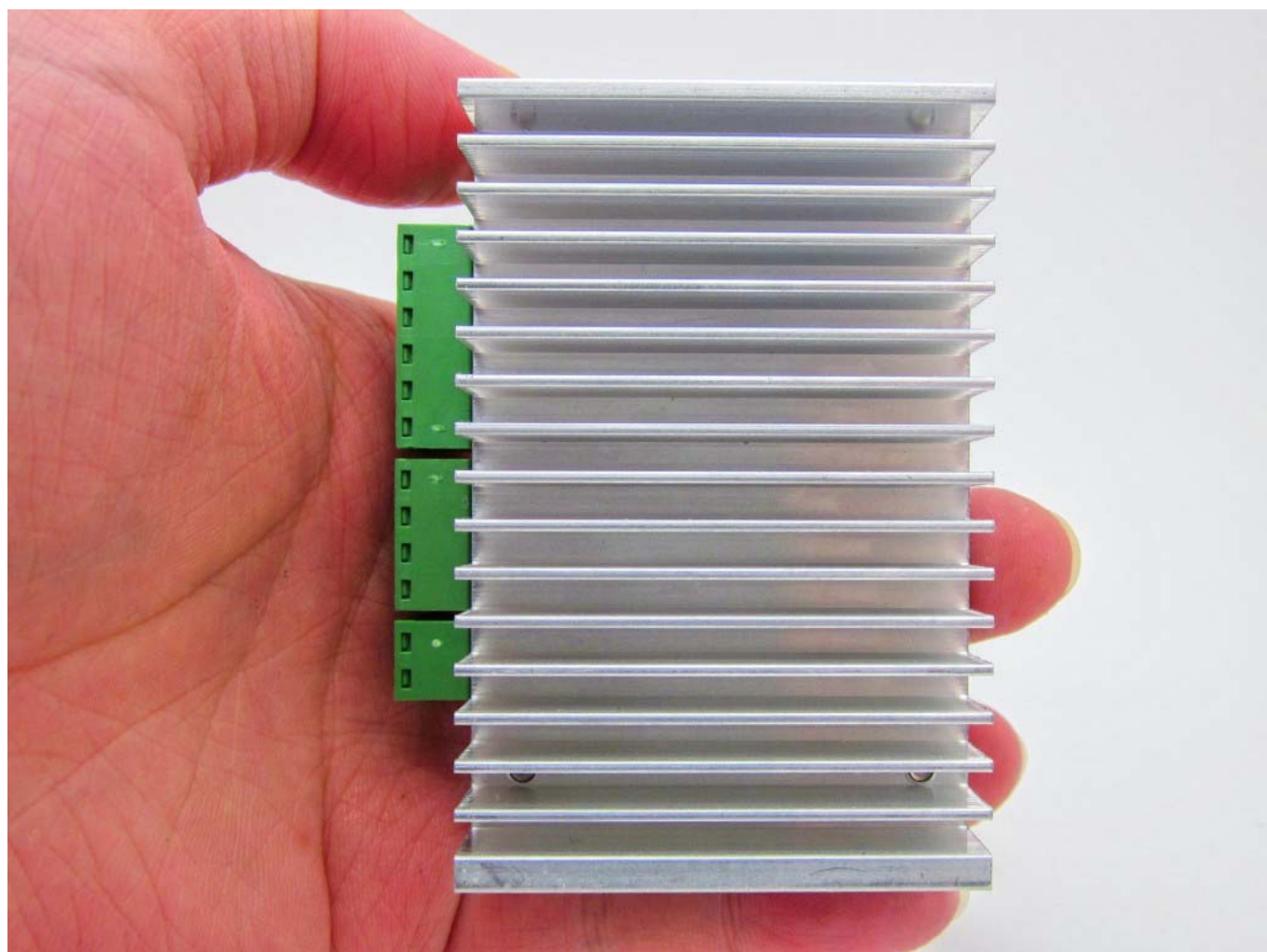
When you get the TB6600 module. **First, do not urgently to use it.** There are so many stepper motor of different kind in the world. Different stepper motor have different internal resistance, **so the TB6600 module adjustable output current is inaccurate.** You must series connection an ammeter in the TB6600 module power. When the

module is working, look carefully on ammeter, if output current is too high, close the power immediately, adjusting current to suitable.

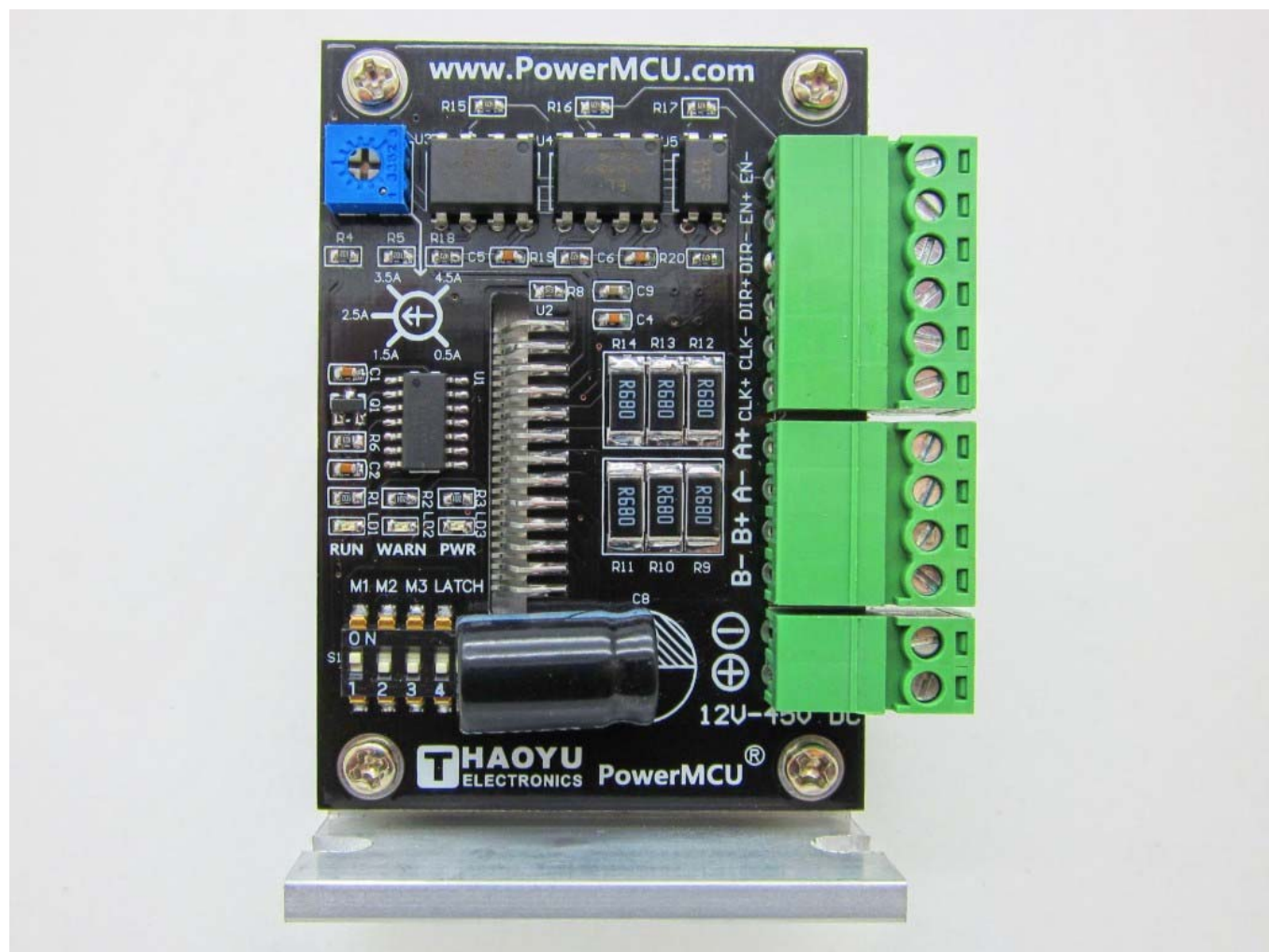
## Shipping List

1. HY-TB6600-Module X 1

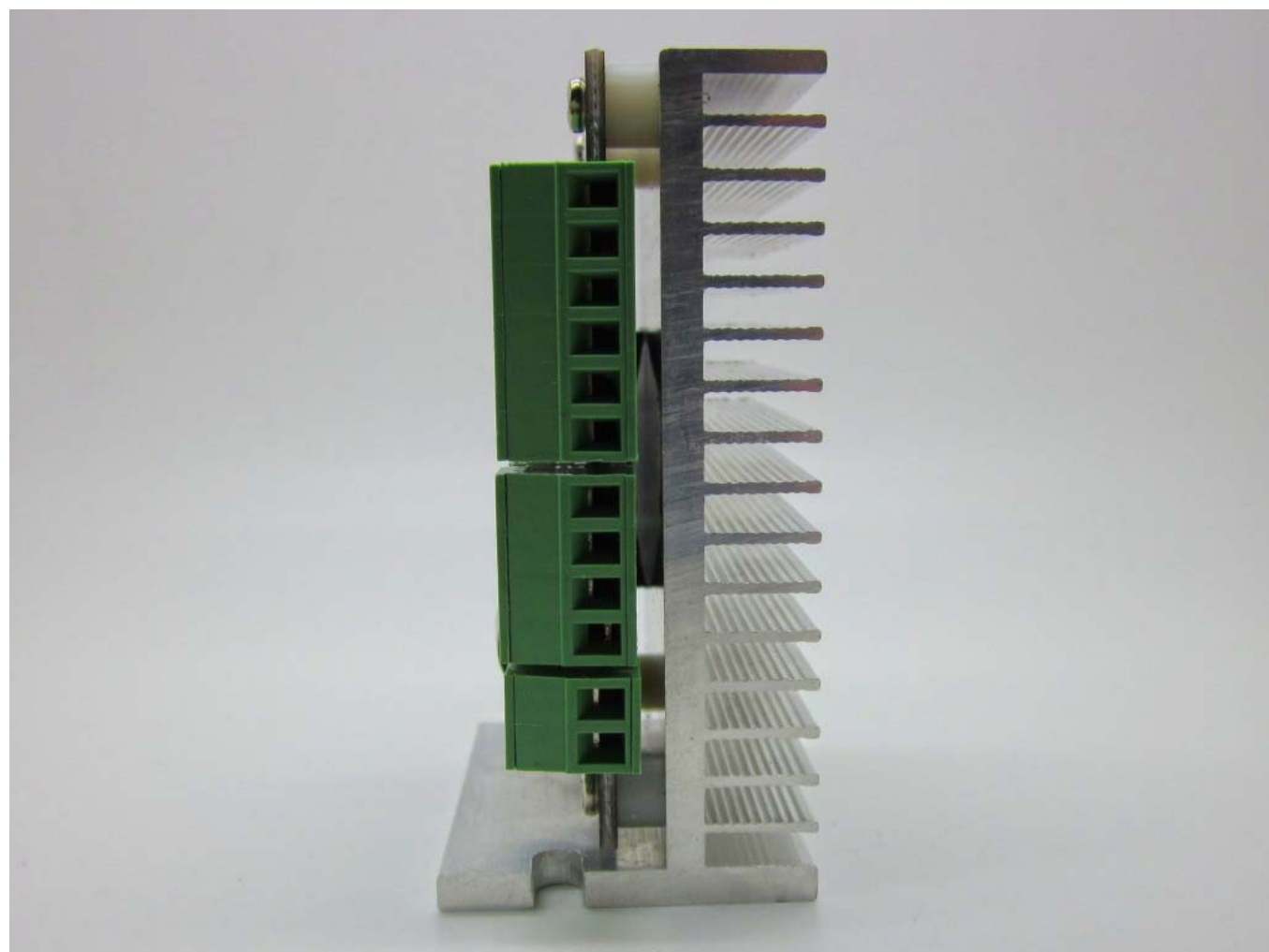


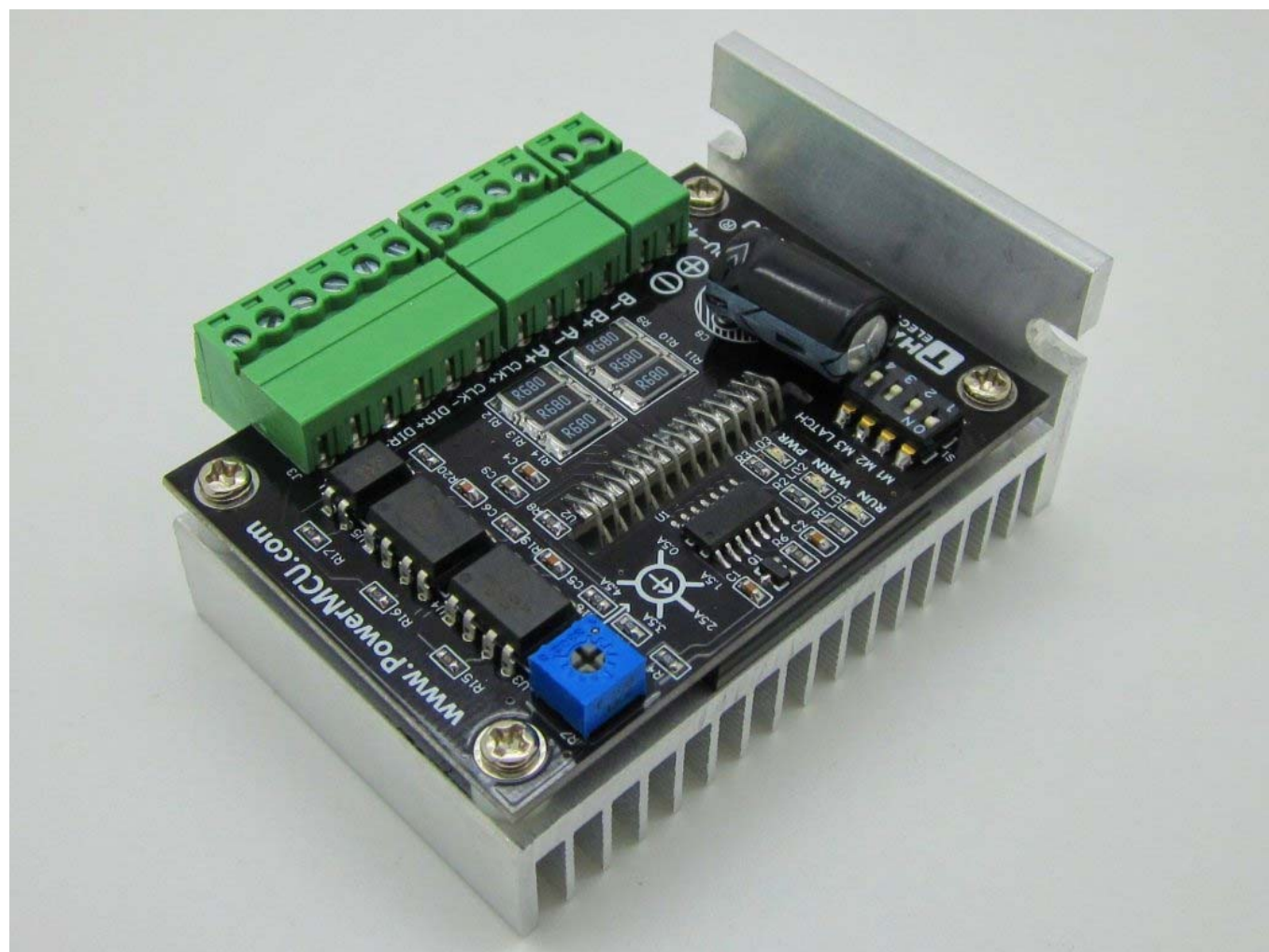


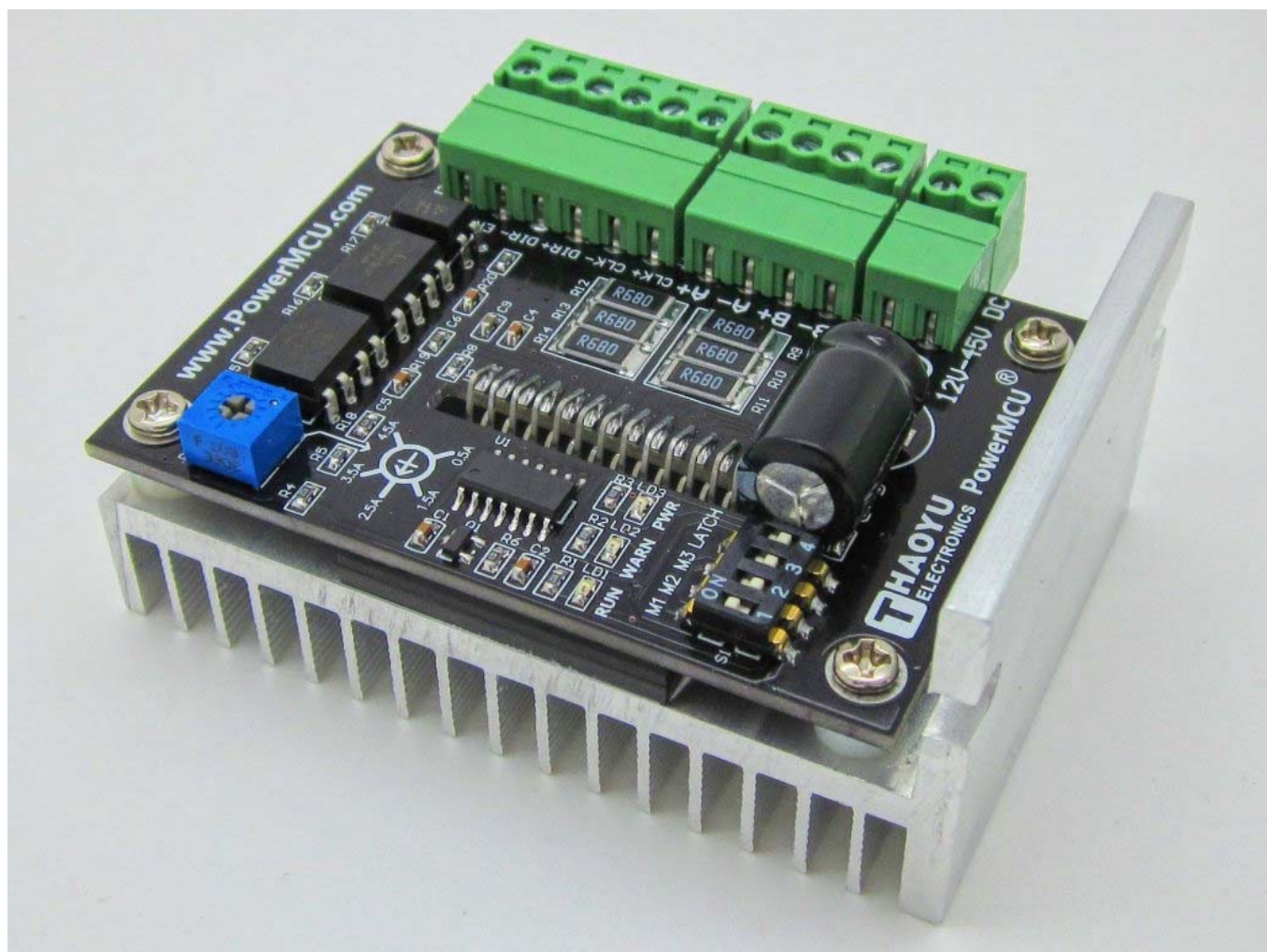


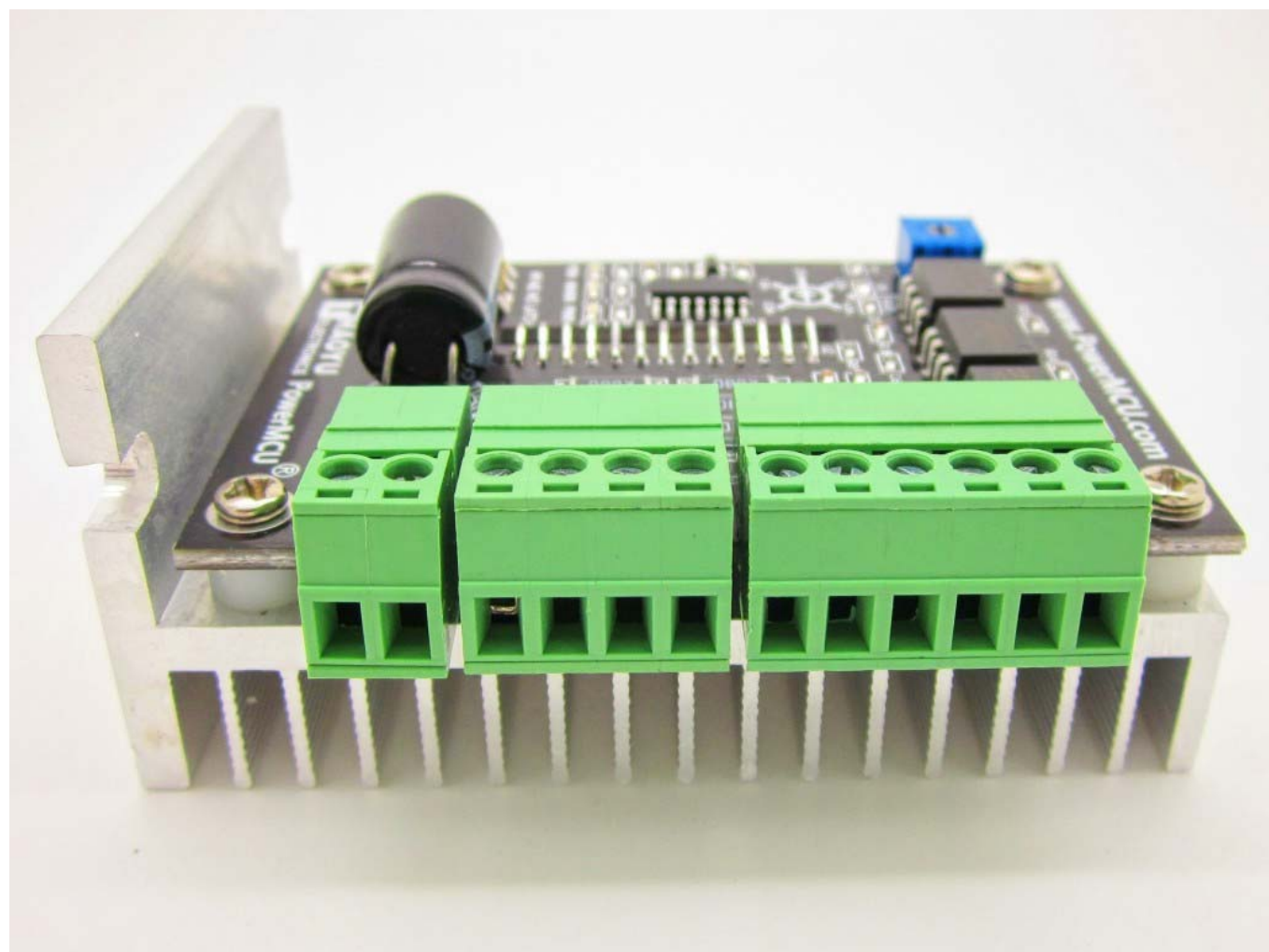




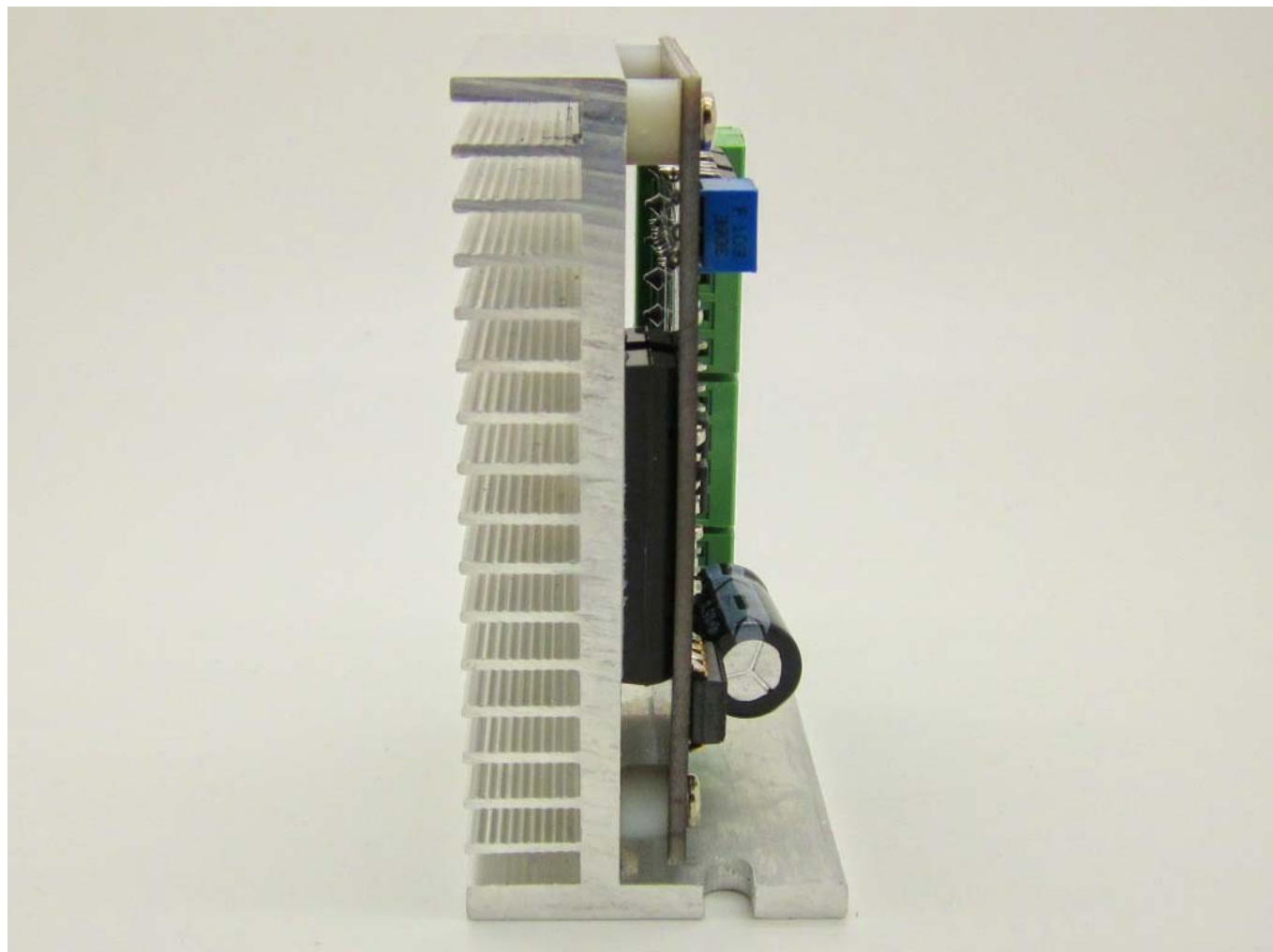


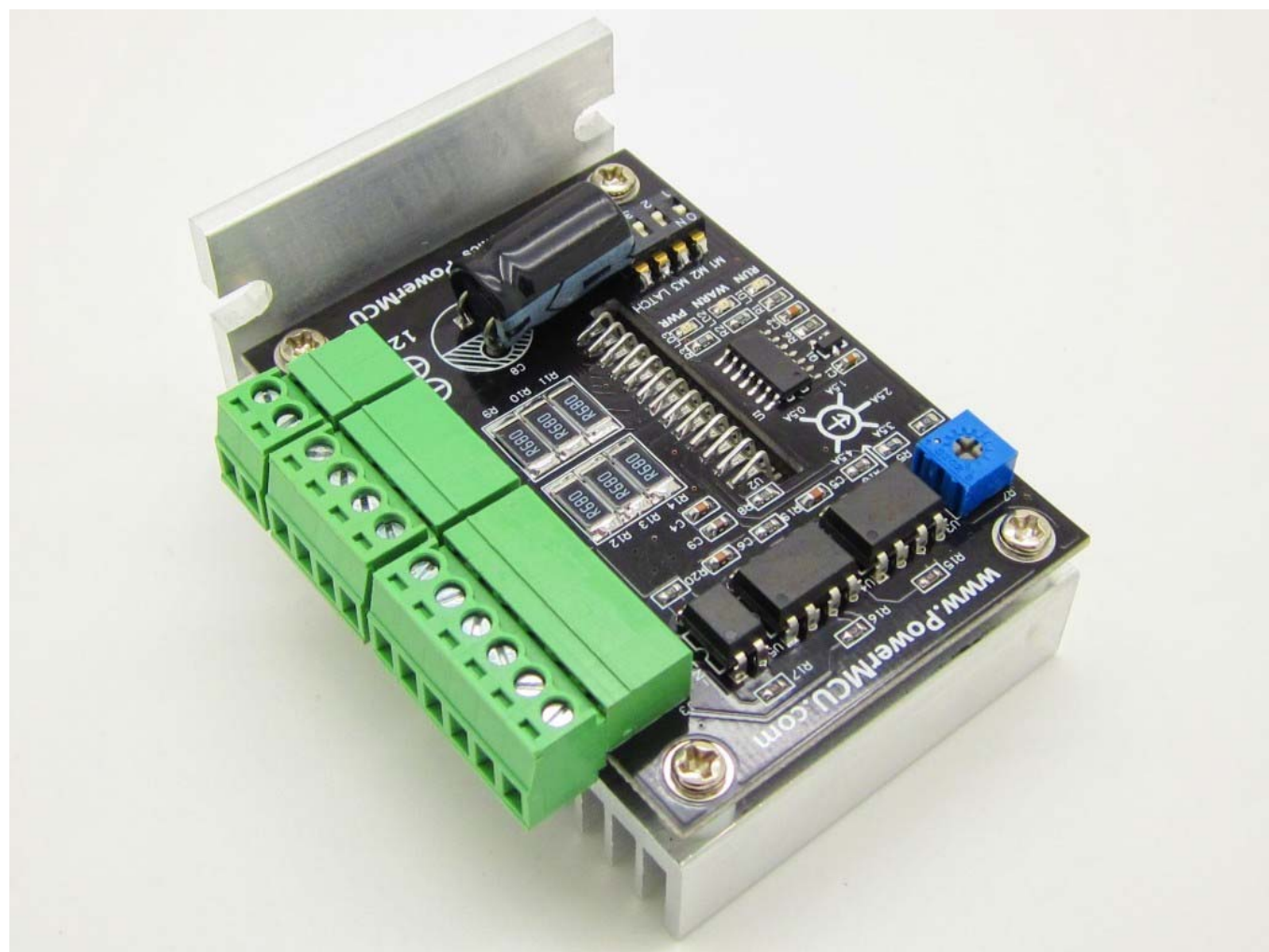


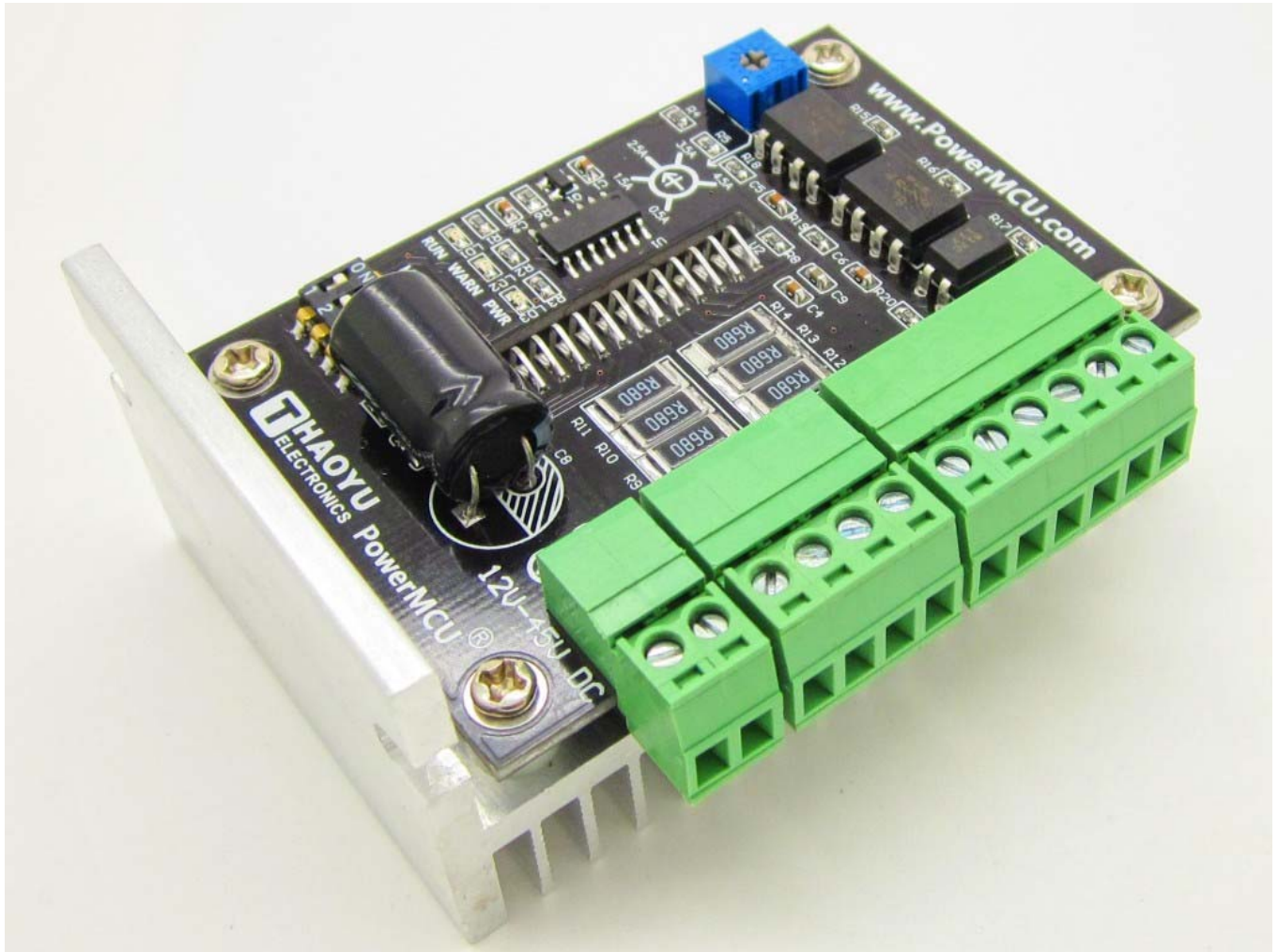












## Document

[TB6600\\_Datasheet.pdf](#)

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