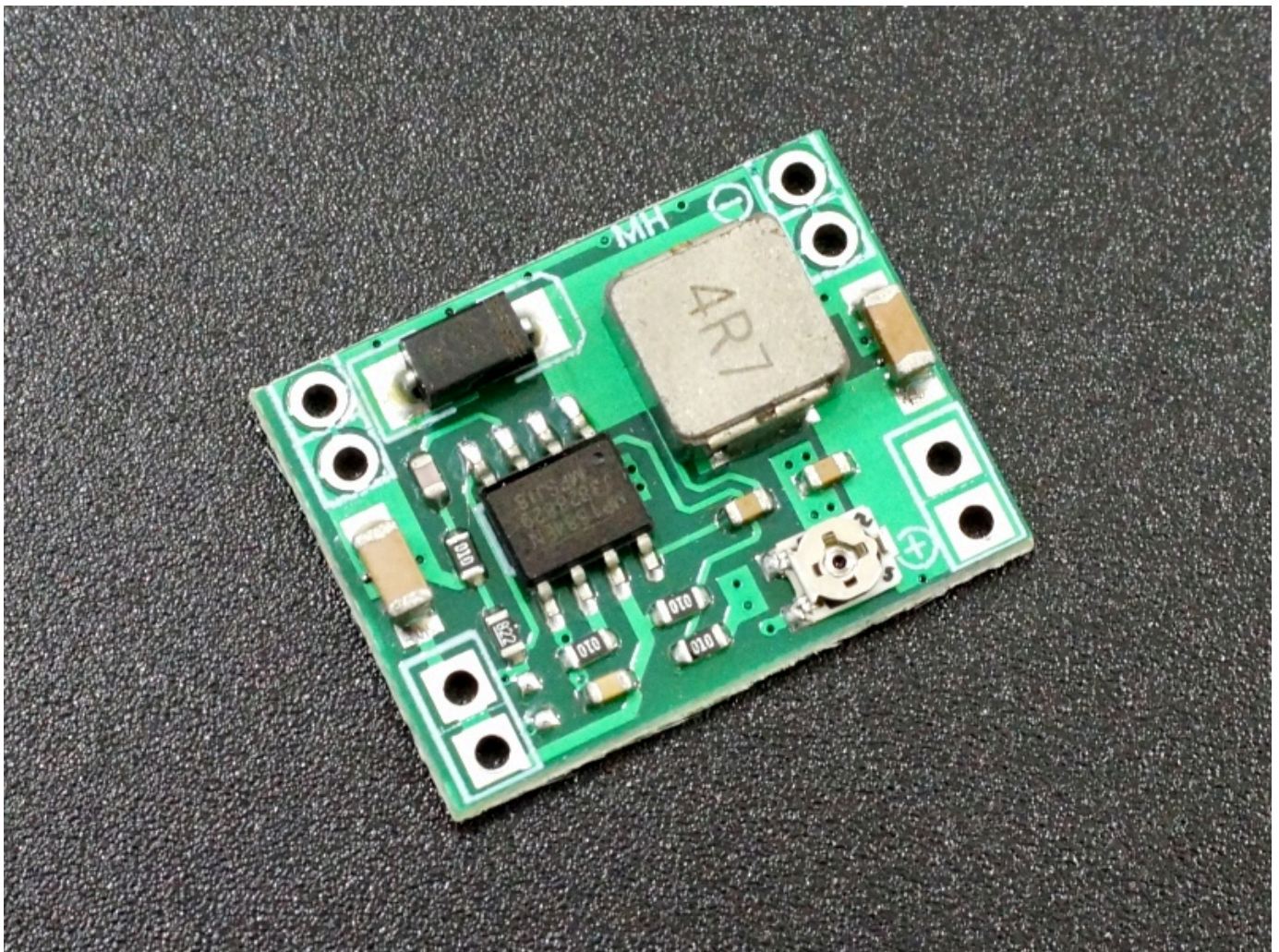
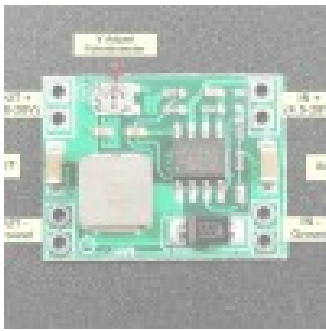


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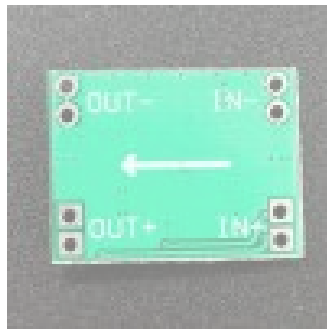
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MP1584 Mini Adjustable DC-DC Step-Down Module

\$1.49

Mini module converts a 4.5 – 28V input down to a 0.8 – 20V output @ up to 2A.

24 in stock

1

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DESCRIPTION

DESCRIPTION

The MP1584 Mini Adjustable DC-DC Step Down Module can step-down a 4.5 to 28V input voltage to a 0.8 to 20V output at up to 2A.

PACKAGE INCLUDES:

- MP1584 Mini Adjustable DC-DC Step Down Module

KEY FEATURES OF MP1584 MINI ADJUSTABLE DC-DC STEP DOWN MODULE:

- Miniature size
- MP1584 converter IC
- Adjustable output voltage w/ adjustment potentiometer
- Excellent load and voltage regulation
- Output current 1.5A with peaks up to 2A
- Input voltage range 4.5 to 28V
- Output voltage range 0.8 to 20V

DC-DC Step-Down converters (also known as 'Buck' converters) convert a higher voltage to a lower voltage while also stepping up the available current.

This DC-DC Step-Down converter is adjustable and capable of outputting a voltage in the range of 0.8 to 20V at a continuous current of up to 1.5A and short-term current of up to 2A.

The input voltage must be higher than the output voltage with a typical voltage drop-out of 1.6V.

The MP1584 is good for up to 3A max which is how it is typically advertised, but in this small packaging with minimal heat sinking, current should be kept down around 1.5A or less for extended operation with peaks of up to 2A. The device is able to use low ESR bulk ceramic capacitors rather than electrolytic caps which avoids long-term aging concerns and contributes to the compact packaging.

The MP1584 converter IC has over current and thermal limiting features built-in to safely shut the device down if driven too hard.

Voltage Adjustment

The module has a single-turn potentiometer for adjustment of the output voltage.

Turning the pot CW decreases the output voltage while turning it CCW increases the output voltage. Because the pot is single-turn, setting an exact voltage is typically not possible, but the setting can easily be set to within a couple percent of the target value which is fine for most applications. For example when targeting 5V, expect to hit 4.95 – 5.05V.

The lowest output voltage is approximately 0.8V. The upper limit of the adjustment range will depend on the input voltage and is typically about 1.6V less than the input voltage. With a 12V input for instance, the upper output limit will be approximately 10.4V before the module may drop out of regulation.

Module Connections

These are compact boards with 4 solder connections. Each connection point has 2 hole/pads for making connections.

- **IN+** = Input Voltage
- **IN-** = Ground
- **OUT+** = Output Voltage
- **OUT-** = Ground. Connected to IN- on module

Note that although the pinout side-to-side is on 0.1" centers, the pinout from end-to-end is not on 0.1" centers, so it will not plug directly into a breadboard.

OUR EVALUATION RESULTS:

These are nice small modules and have excellent voltage and load regulation with a low ripple voltage as long as you don't get too close to the drop-out voltage.

Ripple voltage – Measured @ 30mV-50mV. For best ripple performance, the input voltage should be at least 1.6 to 2V higher than the output.

Voltage regulation – With the output adjusted to 5V, varying the input voltage over the range of 7 – 28V resulted in a 0.01V change in the output.

Load regulation – With input of 12V and output adjusted to 5V, varying the load over the range of 0.0A to 2.0A resulted in a 0.03V change in the output.

The table below gives some thermal results with an ambient temp of approx 22°C and the module operating at different input and output voltages and current loads of 1A, 1.5A and 2A.

In general at 1A, the module is very comfortably limping along. At 1.5A it is starting to get pretty warm but is still in a comfortable range. At 2A it is starting to get pretty toasty and in some cases too warm as indicated in red.

While this measurement is being taken on the converter IC, the inductor thermals are tracking similarly. For long-term reliable use, I would not recommend running more than about 1.5A on this module. For short-term use like for breadboarding, you can pull up to 2A depending on input/output voltages.

Output Current vs Input / Output Voltage

Voltage in	Voltage out	Amps out	Watts out	Amps in	Watts in	Efficiency	IC temp °C
5	3.3	1.0	3.3	0.79	3.95	84%	54
		1.5	4.95	1.21	6.05	82%	70
		2.0					Out of regulation
12	3.3	1.5	4.95	0.5	6.0	83%	67
		2.0	6.6	0.82	9.84		114
	5.0	1.0	5	0.47	5.64	87%	46
		1.5	7.5	0.72	8.64	87%	63
		2.0	10.0	0.97	11.64	86%	87
24	5.0	1.0	5	0.25	6.0	83%	60
		1.0	12	0.55	13.2	91%	63

BEFORE THEY ARE SHIPPED, THESE MODULES ARE:

- Sample inspected and tested per incoming shipment.

FURTHER READING

For more info on DC-DC Converters in general, see our **DC-DC Converter Overview** (<https://protosupplies.com/dc-dc-step-down-converter-overview/>) page.

Notes:

1. Be sure to properly hook up the input and output connections before applying power to avoid possible damage to the module.
2. Under higher current loads, the components can get fairly hot, so use care when handling.

TECHNICAL SPECIFICATIONS

Maximum Ratings		
V_{IN}	Input Voltage	4.5 – 28V
I_O	Maximum Output Current (peak)	2A
Operating Ratings		
V_O	Output Voltage Range	0.8 – 20V
I_O	Output Current (max continuous)	1.5A

Switching Frequency		1MHz
Output Ripple		30-50mV (measured)
Efficiency	Varies depending on load	Up to 91% 82%-91% (measured)
Electrical Isolation		Non-isolated
Dimensions	L x W x H	23 x 17 x 5mm (0.9 x 0.7 x 0.2")
Datasheet		MP1584 IC (https://www.monolithicpower.com/pub/media/document/MP1584_r1.0.pdf)



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