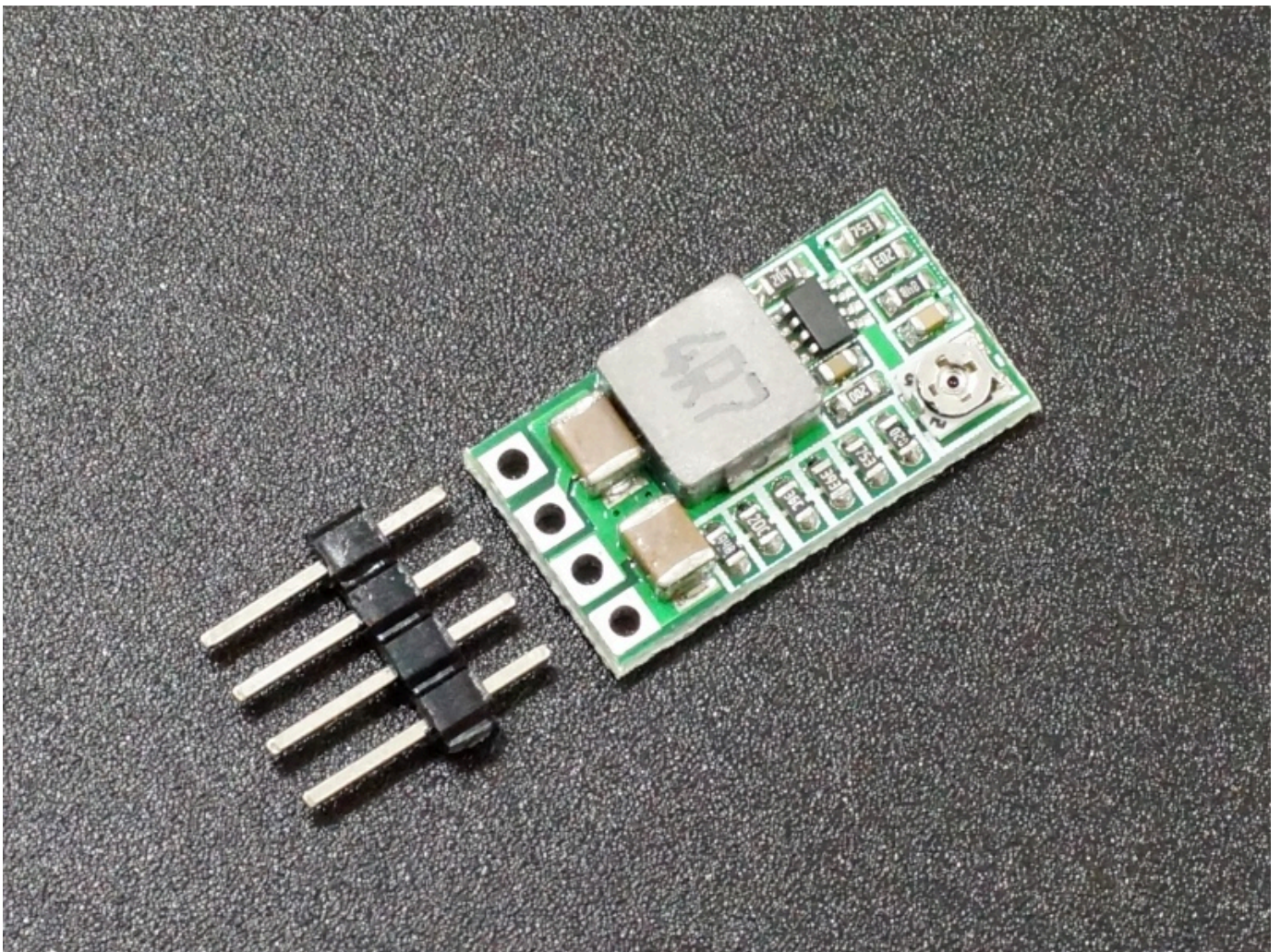
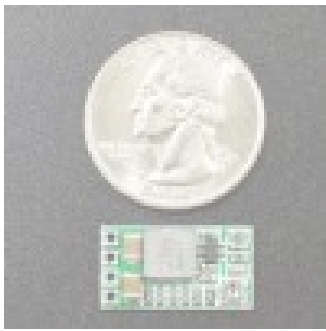


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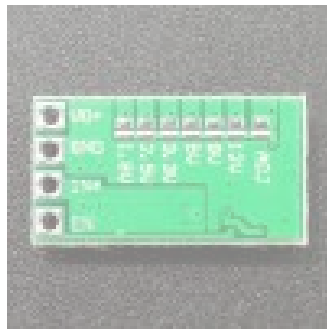
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MP2315 Mini Adjustable DC-DC Step-Down Module

\$1.79

Ultra small module converts 4.5 – 24V input down to a 0.8 – 22V output @ up to 2A.

51 in stock

1

ADD TO CART

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DESCRIPTION

DESCRIPTION

The MP2315 Mini Adjustable DC-DC Step Down Module can step-down a 4.5 to 24V input voltage to a 0.8 to 22V output at up to 2A.

PACKAGE INCLUDES:

- MP2315 Mini Adjustable DC-DC Step Down Module
- 4-pin straight male header strip

KEY FEATURES OF MP2315 MINI ADJUSTABLE DC-DC STEP DOWN MODULE:

- Ultra miniature size
- MP2315 converter IC
- Adjustable output voltage w/ optional fixed voltage outputs
- Excellent load and voltage regulation
- Output current 1.5A with peaks up to 2A
- Input voltage range 4.5 to 24V
- Output voltage range 0.8 to 22V
- Output enable pin compatible with 3.3 & 5V logic

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 22V 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. The module also has an option on the back to cut a trace and bridge solder pads to have the module output a fixed voltage.

The MP2315 is good for up to 3A max which is how it is typically advertised, but in this tiny 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 MP2315 converter IC has over current and thermal limiting features built-in to safely shut the device down if driven too hard.

Voltage Adjustment

Using Adjustable Output

As-shipped, the module has a single-turn potentiometer for adjustment of the output voltage.

Turning the pot CW increases the output voltage while turning it CCW decreases 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 0.6V less than the input voltage. With a 12V input for instance, the upper output limit will be approximately 11.4V.

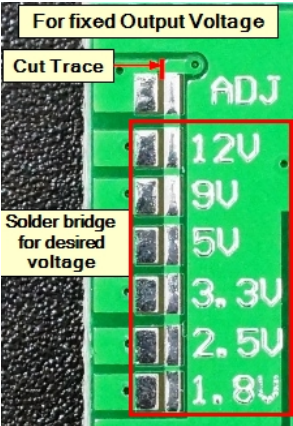
Using Fixed Output

Optionally, a trace on the back of the module can be cut and one of several solder pads can be bridged to have the converter output a fixed voltage of 1.8V, 2.5V, 3.3V, 5V, 9V or 12V.

Cutting the small trace requires a sharp Exacto knife or razor blade and either good eye-sight or a magnifier of some kind. Solder bridging the pads will require a soldering iron with a fairly small tip.

If it is desired to return to the adjustable output, the ADJ pads can be shorted.

In our testing, the accuracy of the fixed output voltages was within 5% on all settings and was very close on the 3.3 and 5V settings as shown in the table below.



Voltage Setting	Measured Output
1.8V	1.71V
2.5V	2.39V
3.3V	3.29V
5V	4.97V
9V	8.77V
12V	11.65V

Output Enable

The module has an EN (Enable) pin which is active HIGH.

The module has this pin pulled high by default, so the module will always be enabled and the EN pin can be left unconnected if the module will always be enabled.

To use this feature, the input can be driven LOW by connecting it to a digital output pin on an MCU or it can be grounded via a switch to disable the output. The EN pin is compatible with 3.3 and 5V logic levels.

Module Connections

These are very compact boards with 4 solder connections on standard 0.1" centers. A male header strip is provided which can be soldered to the board for making connections.

1 x 4 Header

- **EN** = Enable. Active HIGH and pulled HIGH on the module. Pull LOW to disable the module output.
- **IN+** = Input voltage
- **GND** = Ground
- **VO+** = Output voltage

Keep in mind when using these modules on a solderless breadboard that with higher currents the voltage drop through standard breadboard jumpers can become significant. Ensure you use larger gauge wire, keep the wires short and/or double up on the wires to minimize any voltage drop.

OUR EVALUATION RESULTS:

These are actually pretty impressive little modules for their size and have excellent voltage and load regulation with a very low ripple voltage.

Ripple voltage was measured @ 30mV with an increase up to 50mV with no load on the module.

Voltage regulation is spec'd at ±0.5%. With the output adjusted to 5V, varying the input voltage over the range of 6 – 24V resulted in a 0.04V change in the output.

Load regulation is spec'd at ±1%. With input of 12V and output adjusted to 5V, varying the load over the range of 0.0A to 2.0A resulted in a 0.1V change in the output

The table below gives some thermal results with an ambient temp of approx 25°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 2A without any problems.

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	0.77	3.85	86%	43
		1.5	4.95	1.16	5.8	85%	62
		2.0	6.6	1.62	8.1	82%	95
12	3.3	1.5	4.95	0.47	5.64	88%	61
		2.0	6.6	0.64	7.68	86%	85
	5.0	1.0	5	0.46	5.52	91%	55
		1.5	7.5	0.69	8.28	91%	68
		2.0	10.0	0.95	11.4	88%	91
24	5.0	1.0	5	0.25	6.0	83%	62
		1.0	12	0.57	13.68	89%	88

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 – 24V
I _O	Maximum Output Current (peak)	2A
Operating Ratings		
V _O	Output Voltage Range	0.8 – 22V
I _O	Output Current (max continuous)	1.5A
Switching Frequency		500kHz
Output Ripple		30mV (measured)
Efficiency	Varies depending on load	Up to 97.5% 83%-91% (measured)
Electrical Isolation		Non-isolated
Dimensions	L x W x H	20 x 11 x 6mm (0.79 x 0.43 x 0.24")



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