

General Description

The AnyVolt Mini is the little brother of the AnyVolt. It is a miniature step up / step down 0.5A switching DC-DC converter. The output is adjustable from 1.25 to 14V.

The output voltage is set with a small screw potentiometer on the side of the AnyVolt Mini. Once the output voltage is set, it does not matter whether input voltage is higher, lower, or the same as the desired output.

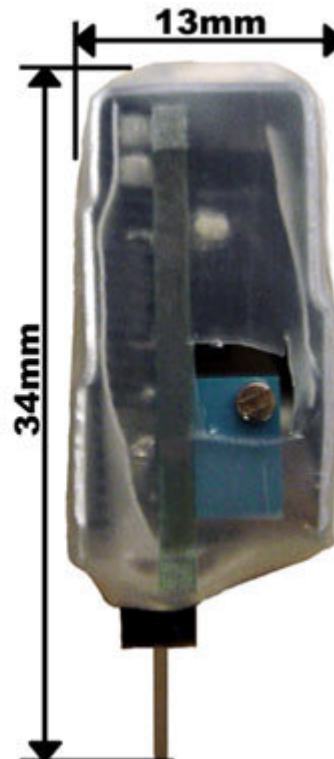
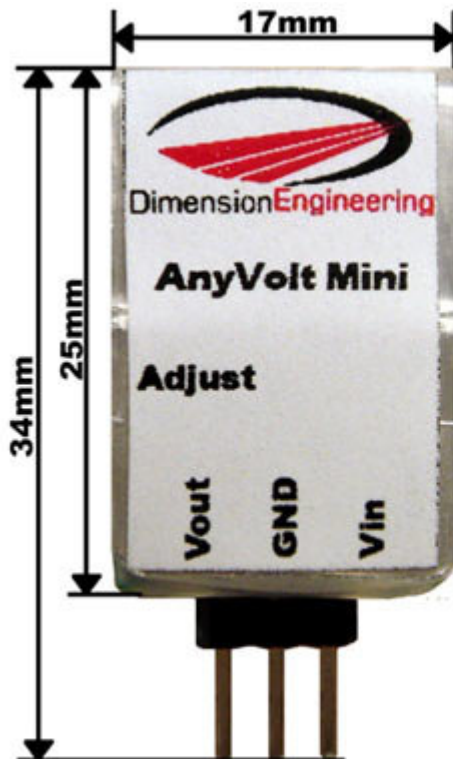
The AnyVolt Mini is pin-compatible with the common 78XX series of linear voltage regulators, so it will work with breadboards and other popular prototyping methods.

Features

- 1.25V to 14V output voltage range
- 3.3V to 14V recommended input voltage range
- Extended mode operation down to 2.8V input
- 0.5A max input or output current
- 0.75A peak input or output current
- <50mV typical ripple at 0.5A out
- No external components needed
- 80% typical efficiency, up to 84%

Applications

- Lab work and prototyping
- Powering small audio amplifiers
- Driving multiple LEDs in series
- Backlit LCD drive
- Solar powered applications
- High power crystal based radio transmitters
- Battery powered applications
- Renewable energy source applications
- Universal battery charger



Characteristic	Min	Typical	Max
Input Voltage	2.8V ¹	3.3V to 12V	14V
Output Voltage	1.25V	1.25V to 14V	15.5V ²
Continuous Input Current			0.5A
Peak Input Current (30 sec)			0.75A
Continuous Output Current			0.5A
Peak Output Current (30 sec)			0.75A
Output Ripple (Vp-p)	18mV	30mV	200mV
Quiescent current draw	<1mA	10mA	32mA ³
Efficiency		80%	84%

¹See section on extended mode operation.

²Max output varies with manufacturing processes.

³3.3V in, 14V out

Adjusting the output voltage

With the adjustment screw facing you, turning it clockwise increases the voltage, similar to the volume control on a stereo system.

Current limits

Input and output current to/from the AnyVolt Mini should be kept track of with a multimeter if you anticipate driving heavy loads.

Stepping up from a lower to a higher voltage means that there will be a higher current on the input than the output. For this reason, **it is important to make sure that both the input and output current limits of 0.5A aren't being exceeded.** If for some reason you cannot use a multimeter to monitor input current, you can also implicitly derive the input current using the input voltage, output voltage, and output current.

Example:

The output of the AnyVolt Mini in a certain project is 12V, and it is supplying a constant 150mA. What will the input current be if I am powering the AnyVolt with a 5V supply?

“Power = Volts * Amps”

$12V * 0.15A = 1.8W$

So the power output is 1.8W.

“Output power / efficiency = Input power”

Looking at the efficiency curves of the AnyVolt datasheet, efficiency is about 77% in this situation.

$1.8W / 0.77 = 2.34W$

So the power going into the AnyVolt Mini is 2.34W

“Power / Volts = Amps”

$2.34W / 5V = 0.47A$

So the current at the AnyVolt's input is around 0.47A. This is within limits for now, but if the input voltage supply were to drop significantly below 5V, the overcurrent condition would be reached.

Overcurrent behaviour

After the 0.5A current limit has been considerably exceeded, the AnyVolt Mini will start to reduce the output voltage in an attempt to reduce the load on the device. However, the AnyVolt Mini never shuts down. The result of this is that under exceptionally heavy ($>0.8\text{A}$) loads, the 'Mini is not able to perform the necessary limiting and will overheat and possibly fail. **The AnyVolt Mini cannot tolerate a short circuited output for more than 20 seconds.**

Extended mode operation

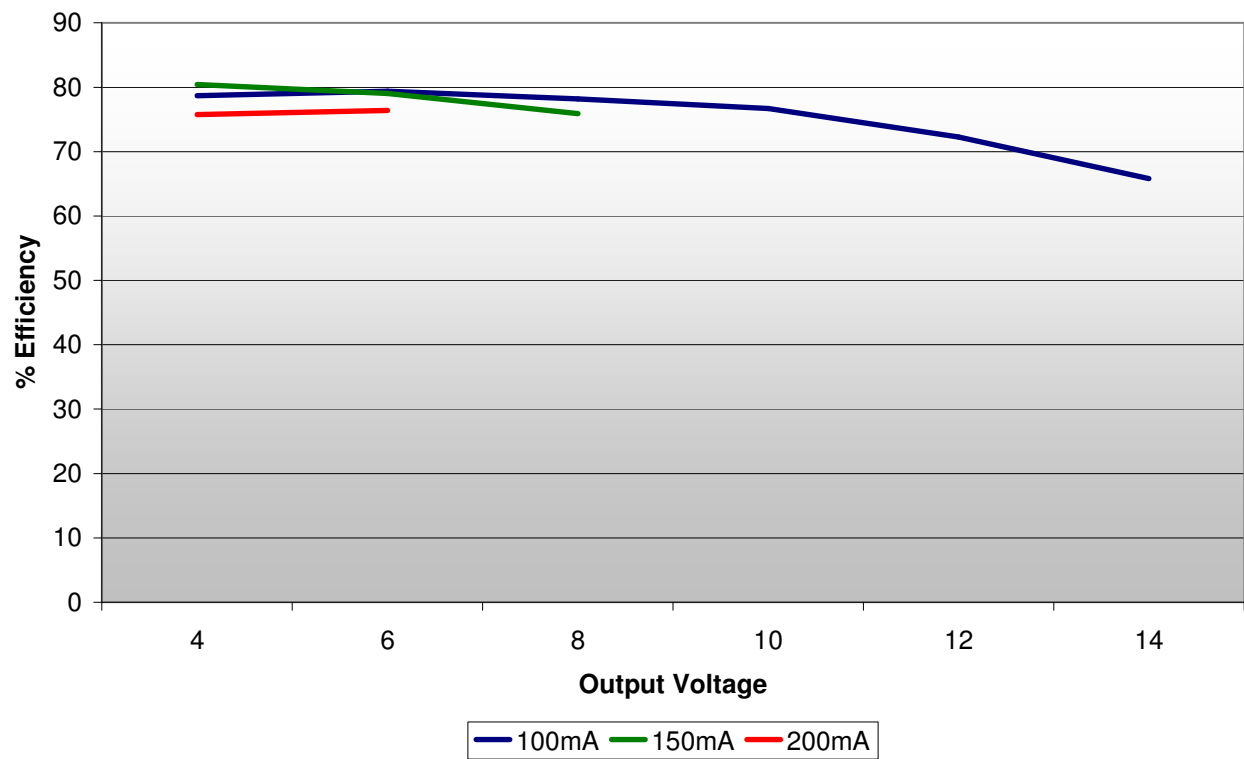
The AnyVolt Mini is capable of operating below its minimum recommended input voltage of 3.3V. This will not damage the 'Mini, but you must be aware that efficiency drops drastically beyond this point to under 50%. The output voltage can also start dropping well before the 500mA limit is reached. For example, at 2.8V in, the max load with 6V out is 50mA. At 12V out the max is 39mA. With low enough loads, you can still step voltage up to much higher values and still power useful devices.

Additional notes

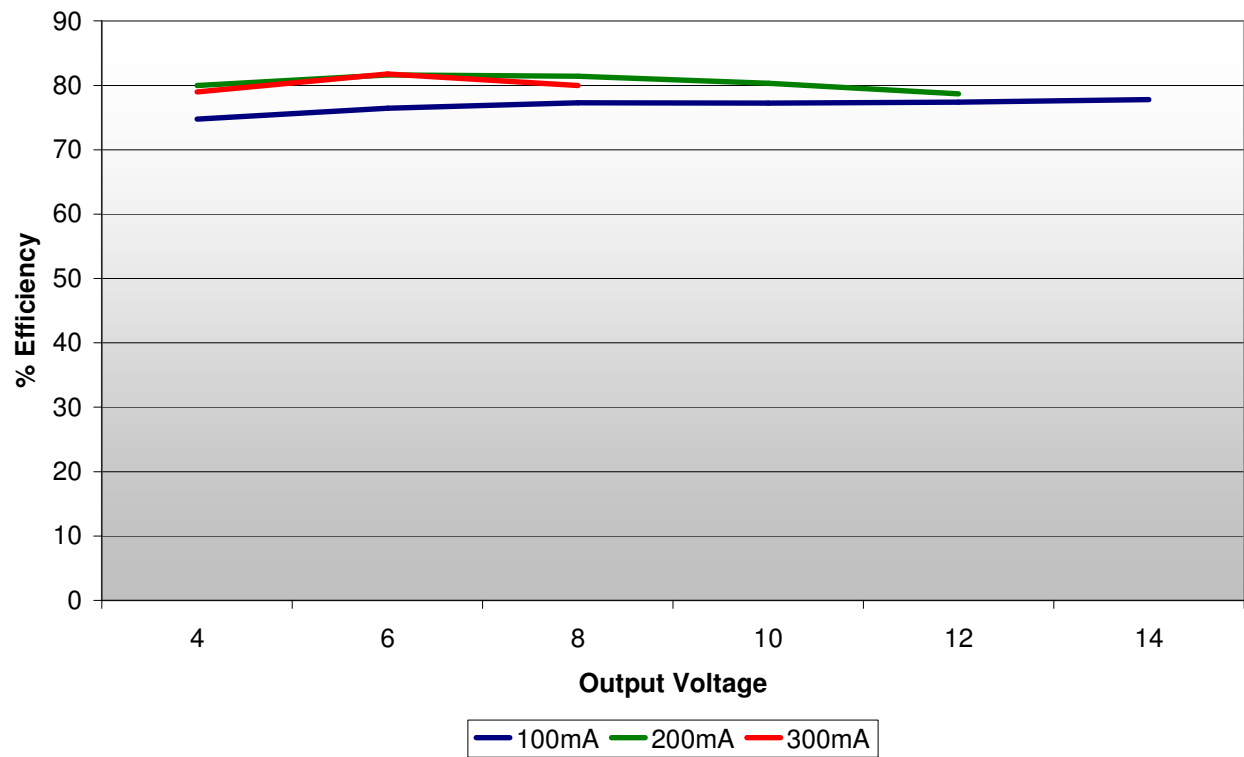
The AnyVolt Mini uses an 11 turn worm gear driven potentiometer and cannot wiggle loose. Do not apply glue to the adjustment pot.

Efficiency Curves

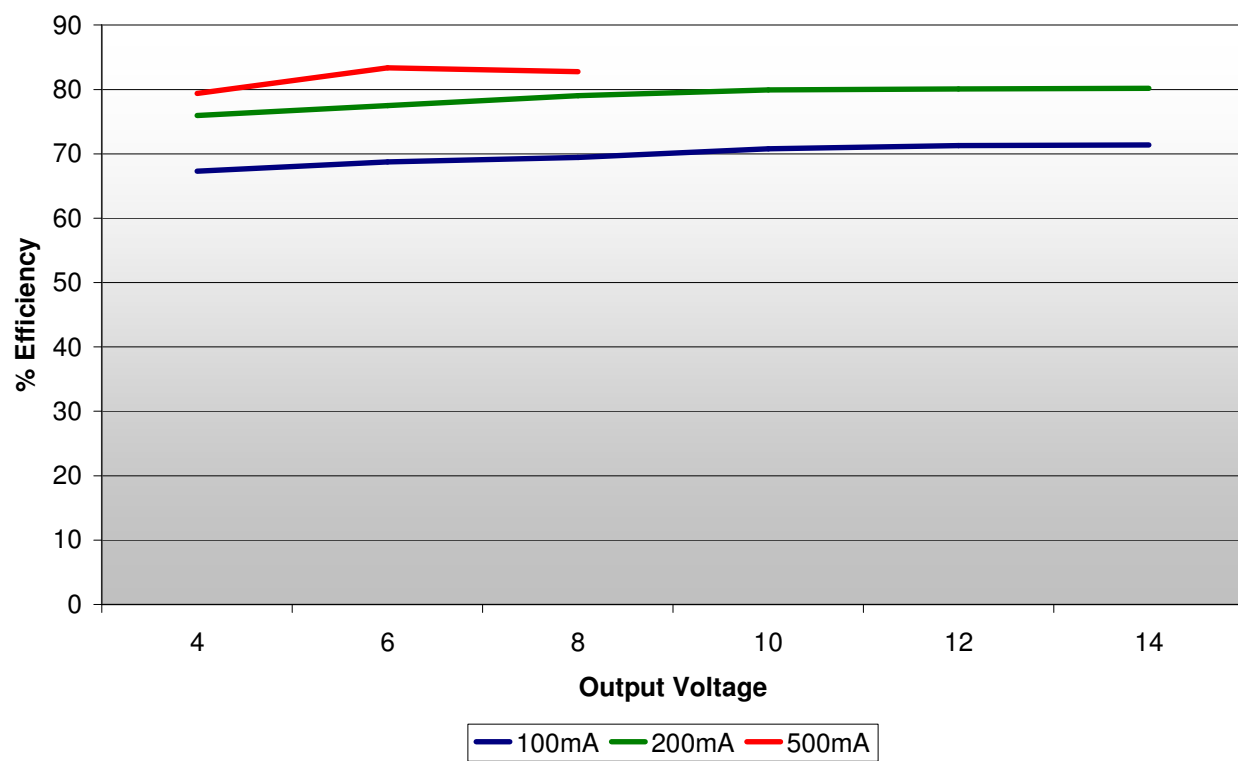
Efficiency vs Output Voltage at 3.3V in



Efficiency vs Output Voltage at 5V in



Efficiency versus Output Voltage at 9V in



Efficiency versus Output Voltage at 12V in

