

POLOLU ADJUSTABLE BOOST REGULATOR

2.5-9.5V

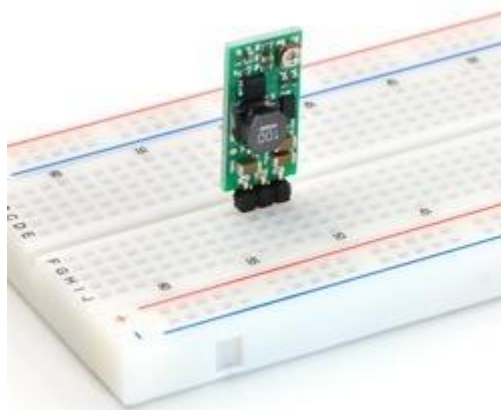
/POLOLU ADJUSTABLE BOOST REGULATOR

4-25V

USER'S GUIDE

CONNECTIONS

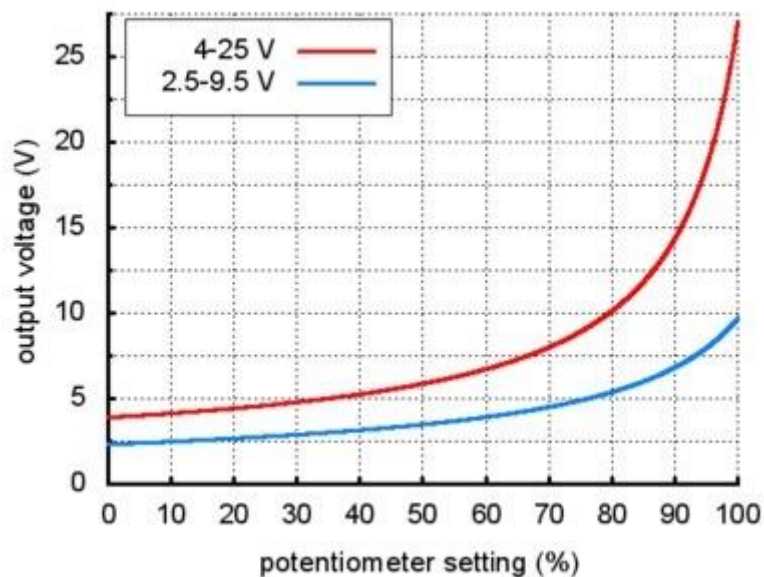
The boost regulator has just three connections: the input voltage, ground, and the output voltage. These three connections are labeled on the back side of the PCB, and they are arranged with a 0.1" spacing along the edge of the board for compatibility with standard solderless breadboards and perfboards and connectors that use a 0.1" grid. You can solder wires directly to the board or solder in either the 3×1 [straight male header strip](#) or the 3×1 [right-angle male header strip](#) that is included.



SETTING THE OUTPUT VOLTAGE

The output voltage can be adjusted using a meter and a light load (e.g. a 10 k Ω resistor). Turning the potentiometer clockwise increases the output voltage. The output voltage can be affected by a screwdriver touching the potentiometer, so the output measurement should be done with nothing touching the potentiometer.

Warning: You should be careful not to use an input voltage that exceeds the output voltage setting, so we recommend setting the output voltage with the input voltage around or below 2.5 V (e.g. using one or two alkaline batteries). Note that the potentiometer has no physical end stops, which means that the wiper can be turned 360 degrees and into an invalid region in which the output voltage is set to approximately 2.5 V (for both the 2.5 V to 9.5 V and 4 V to 25 V versions).



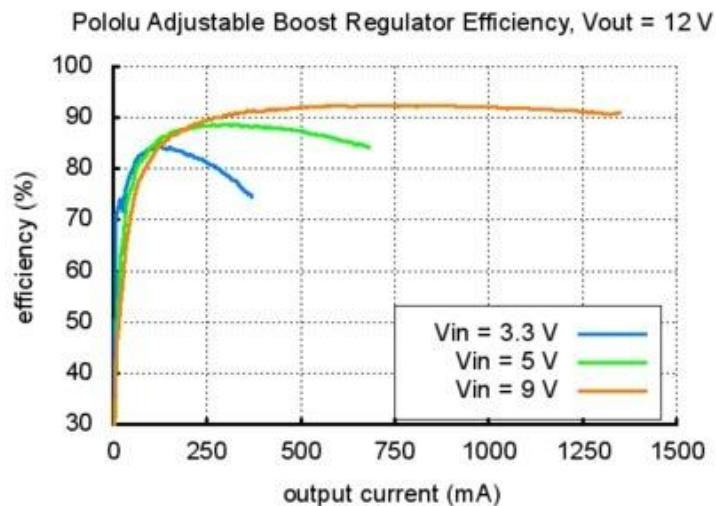
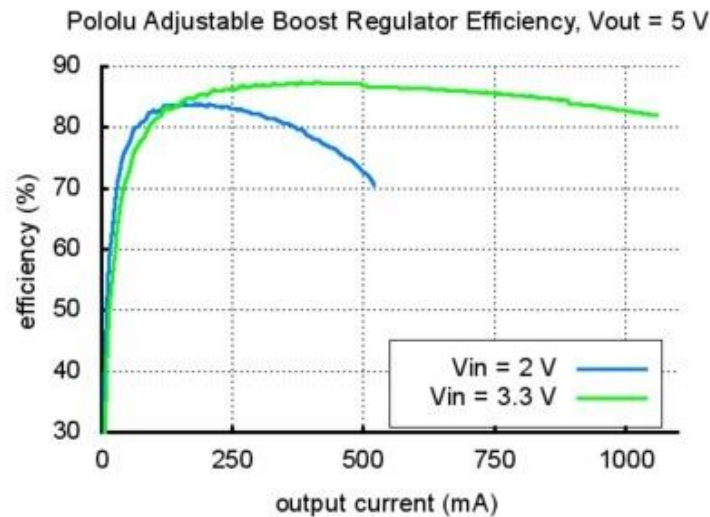
Output voltage settings for the adjustable boost regulators.

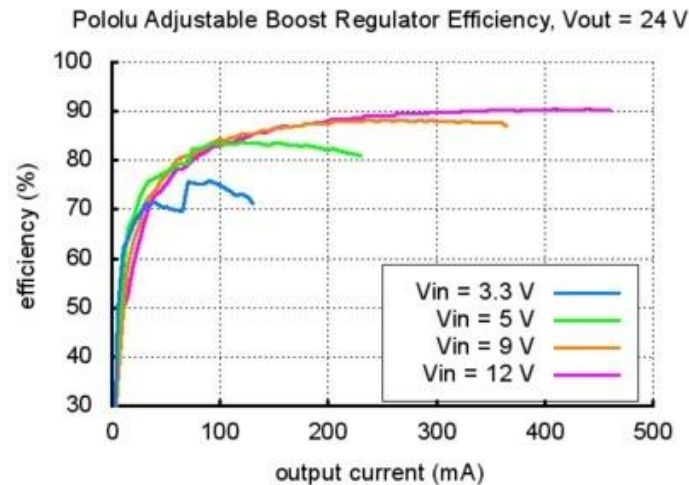
The **absolute limit** for the input voltage is double the output voltage setting. For example, if the output is set to 6 V, the input must not exceed 12 V. Once the input exceeds the output set point, the output voltage will rise with the input voltage since the input is connected to the output through an inductor and a diode.

Note: The trimmer potentiometer is not rated for continual adjustment back and forth; the intended application is to set the output voltage a few times in its life.

EFFICIENCY AND AVAILABLE OUTPUT CURRENT

The available output current depends on the input and output voltages. The input current is limited to approximately 2 A, and, as shown in the graphs below, the efficiency is typically 80% to 90%. Therefore, the maximum available current will be approximately 800 mA when doubling the input voltage and approximately 400 mA when quadrupling the input voltage. At high output powers, the 20% lost in the regulator will cause substantial heating, which can limit the available output power (the regulator will automatically shut off if its internal temperature gets too high). At low output currents and high input and output voltages, the efficiency drops closer to 50%, though the lower power involved prevents heating from being an issue. Some output voltages shown in the efficiency graphs below can only be achieved using the [4-25V adjustable boost regulator](#).





LC VOLTAGE SPIKES

When connecting voltage to electronic circuits, the initial rush of current can cause voltage spikes that are much higher than the input voltage. If these spikes exceed the regulator's absolute maximum voltage (16 V), the regulator can be destroyed. If you are connecting more than approximately 10 V or your power leads or supply has high inductance (e.g. your input leads are longer than a few inches), we recommend soldering a $33\mu\text{F}$ or larger electrolytic capacitor close to the regulator between VIN and GND. The capacitor should be rated for at least 25 V.