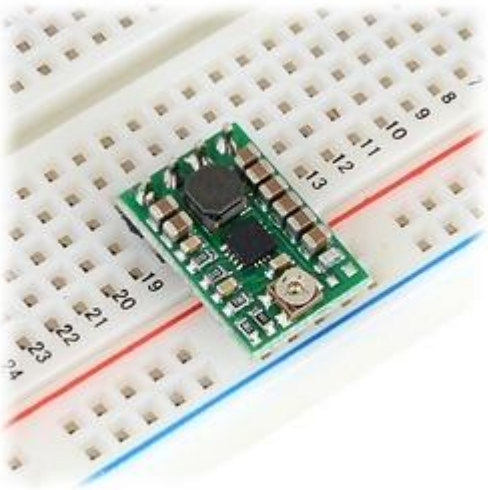
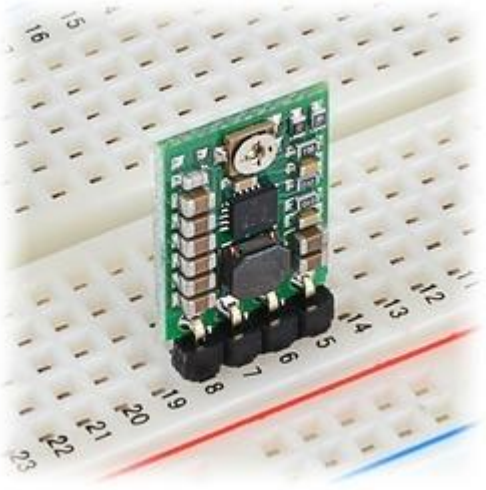
POLOLU 3.3V STEP-UP/STEP-DOWN VOLTAGE REGULATOR S7V8F3

USER'S GUIDE

CONNECTIONS

The step-up/step-down regulator has four connections: shutdown (SHDN), input voltage (VIN), ground (GND), and output voltage (VOUT).



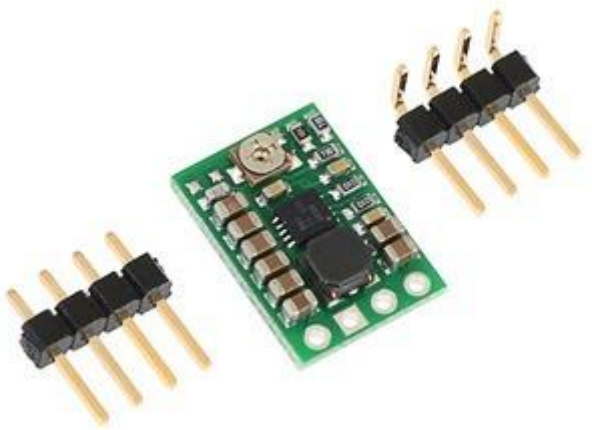


The SHDN pin can be driven low (under 0.4 V) to power down the regulator and put it in a low-power state. The quiescent current in this sleep mode is dominated by the current in the 100k pull-up resistor from SHDN to VIN. With SHDN held low, this resistor will draw 10 µA per volt on VIN (for example, the sleep current with a 5 V input will be 50 µA). The SHDN pin can be driven high (above 1.2 V) to enable the board, or it can be connected to VIN or left disconnected if you want to leave the board permanently enabled.

The input voltage, VIN, should be between 2.7 V and 11.8 V. Lower inputs can shut down the voltage regulator; higher inputs can destroy the regulator , so you should ensure that noise on your input is not excessive, and you should be wary of destructive LC spikes (see below for more information).

The output voltage, VOUT, is determined by the trimmer potentiometer position. See the Setting the Output Voltage section below for details.

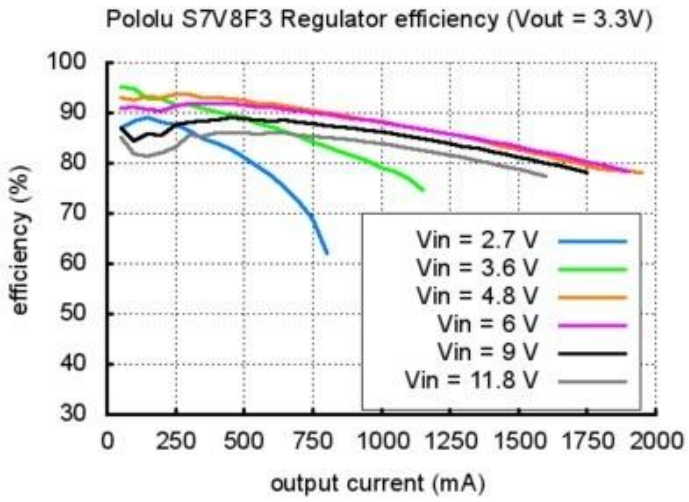
The four connections are labeled on the back side of the PCB, and they are arranged with a 0.1″ spacing along the edge of the board for compatibility with standard solderless breadboards and perfboards and connectors that use a 0.1″ grid. You can solder wires directly to the board or solder in either the 4×1 straight male header strip or the 4×1 right-angle male header strip that is included.



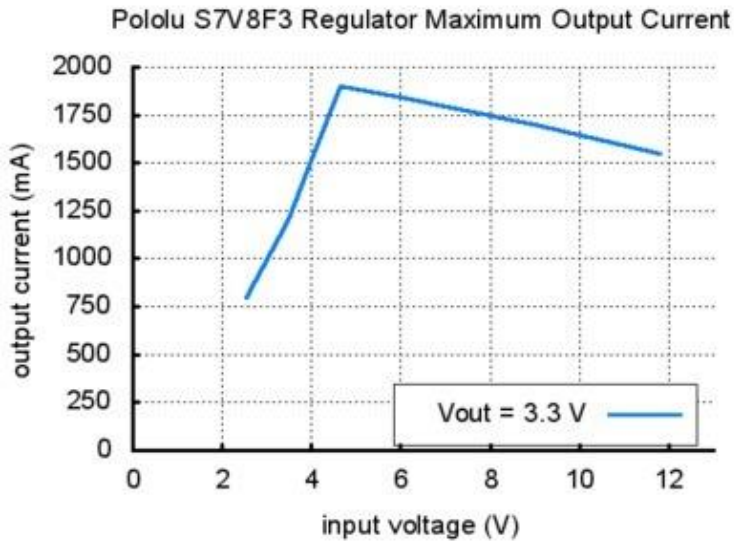
TYPICAL EFFICIENCY AND OUTPUT CURRENT

The efficiency of a voltage regulator, defined as (Power out)/(Power in), is an important measure of its performance, especially when battery life or heat are concerns. As shown in the graphs below, this switching regulator has an efficiency between 80% to

95% for most applications. A power-saving feature maintains these high efficiencies even when the regulator current is very low.



The maximum achievable output current of the board varies with the input voltage but also depends on other factors, including the ambient temperature, air flow, and heat sinking. The graph below shows output currents at which this voltage regulator's over-temperature protection typically kicks in after a few seconds. These currents represent the limit of the regulator's capability and cannot be sustained for long periods, so the continuous currents that the regulator can provide are typically several hundred milliamps lower, and we recommend trying to draw no more than about 1 A from this regulator throughout its input voltage range.



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 maximum voltage, the regulator can be destroyed. If you are connecting more than about 9 V, using power leads more than a few inches long, or using a power supply with high inductance, we recommend soldering a 33 µF or larger electrolytic capacitor close to the regulator between VIN and GND. The capacitor should be rated for at least 16 V.