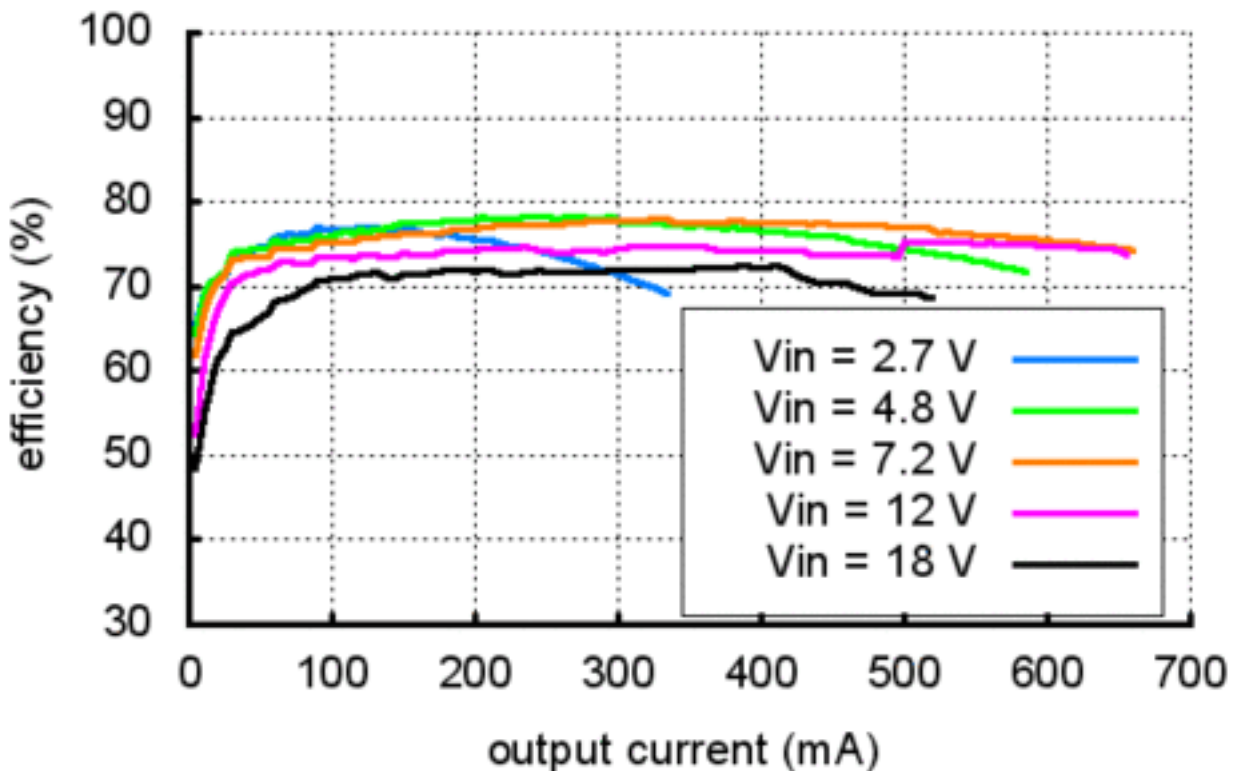


Pololu 5V Step-Up/Step-Down Voltage Regulator S10V4F5

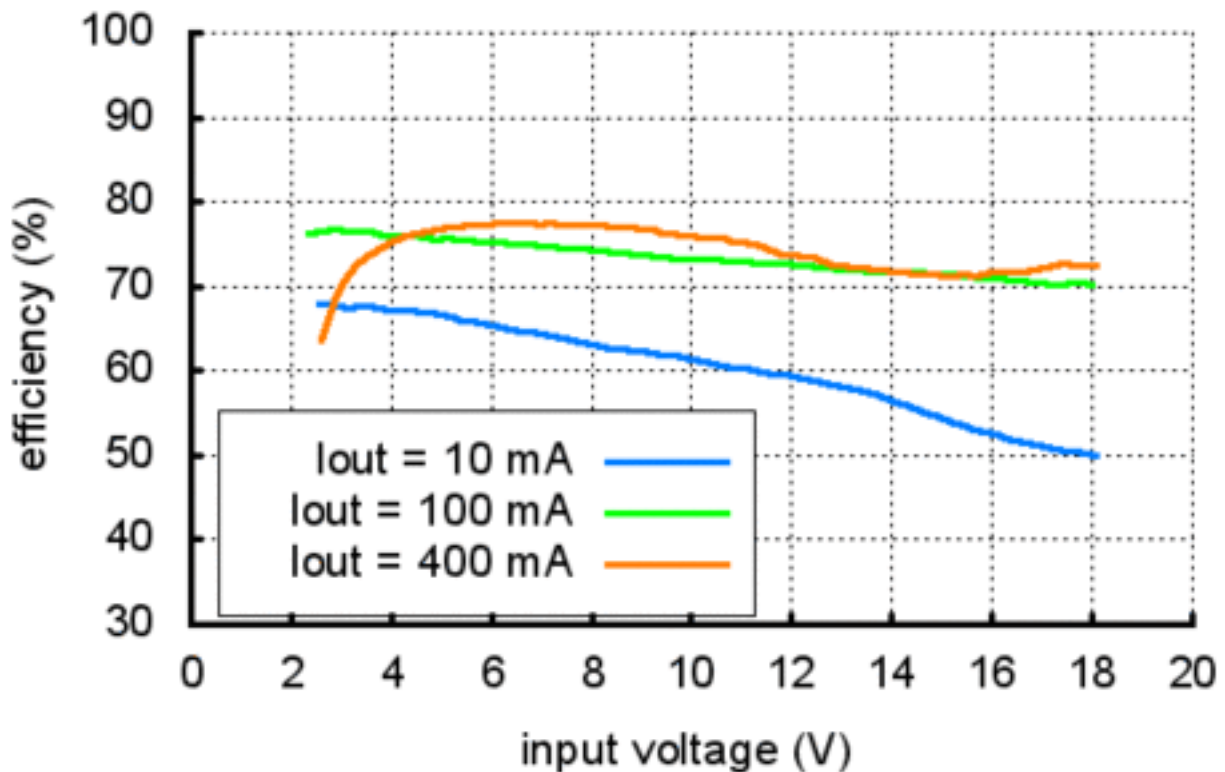
Typical Efficiency and Output Current

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 typically has an efficiency of 70% to 80%.

Pololu S10V4F5 Regulator
Efficiency vs Output Current (Vout = 5V)

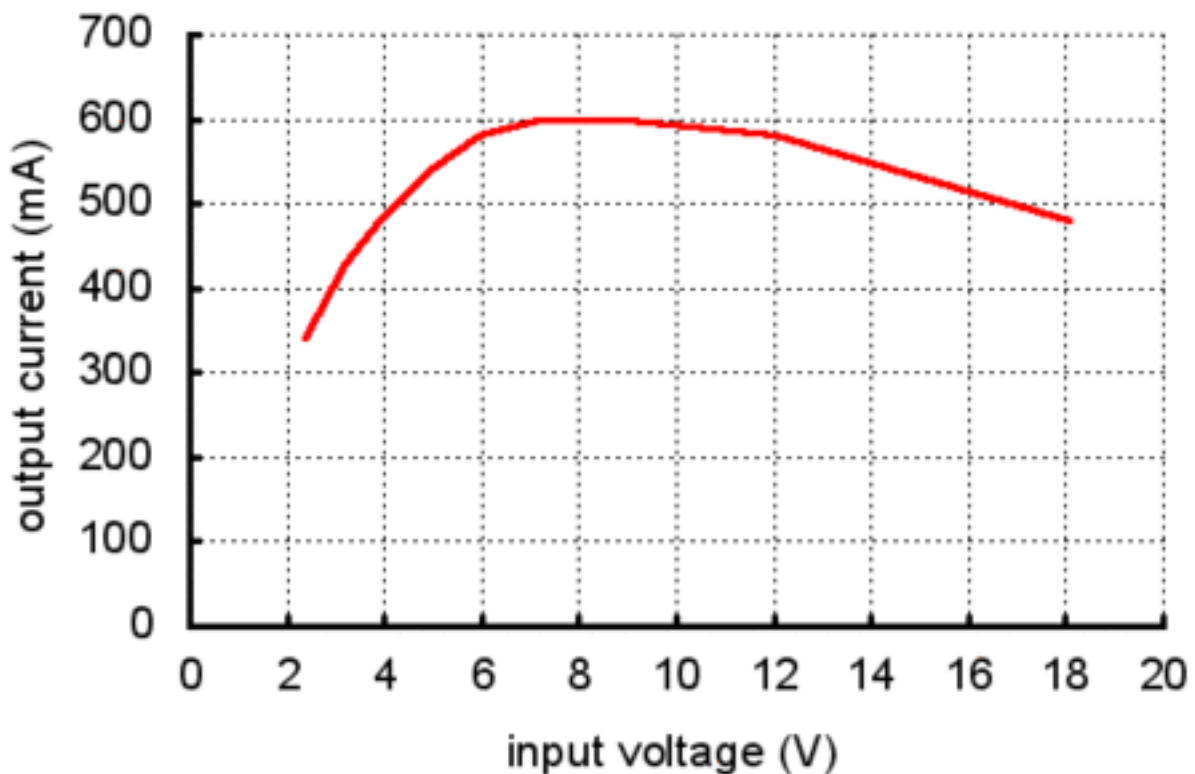


Pololu S10V4F5 Regulator
Efficiency vs Input Voltage ($V_{out} = 5V$)



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 lower.

Pololu S10V4F5 Regulator
Maximum Output Current vs Input Voltage ($V_{out} = 5\text{ V}$)



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. In our tests with typical power leads (~30" test clips), input voltages above 11 V caused spikes over 18 V. You can suppress such spikes by soldering a 33 μF or larger electrolytic capacitor close to the regulator between VIN and GND.

More information about LC spikes can be found in our application note, [Understanding Destructive LC Voltage Spikes](#).