Pololu 3.3V, 2.5A Step-Down Voltage Regulator D24V25F3

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. This family of switching regulators typically has an efficiency of 85% to 95%, though the actual efficiency in a given system depends on input voltage, output voltage, and output current. See the efficiency graph near the bottom of this page for more information.
The maximum achievable output current is typically around 2.5 A, but this depends on many factors, including the ambient temperature, air flow, heat sinking, and the input and output voltage.

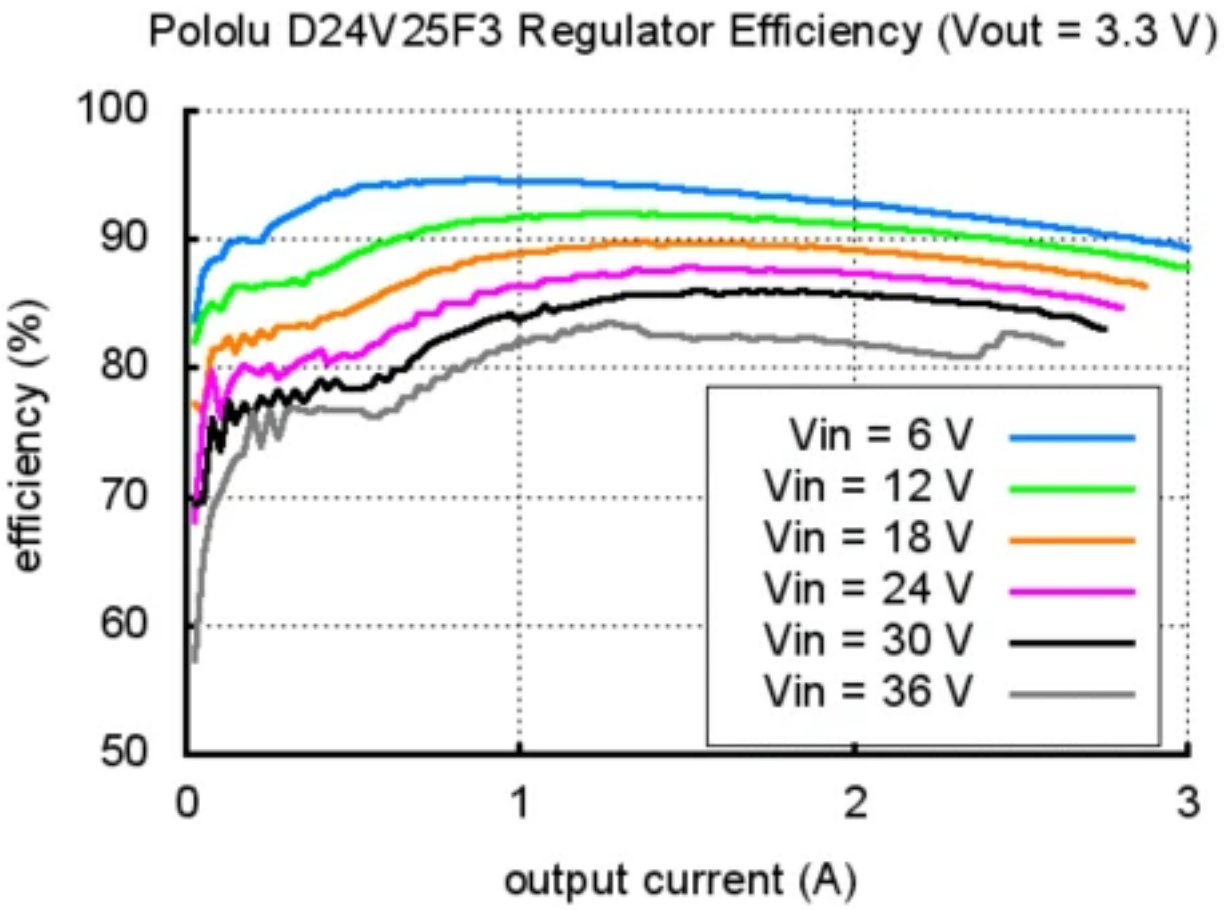
Typical dropout voltage

The dropout voltage of a step-down regulator is the minimum amount by which the input voltage must exceed the regulator's target output voltage in order to ensure the target output can be achieved. For example, if a 5 V regulator has a 1 V dropout voltage, the input must be at least 6 V to ensure the output is the full 5 V. Generally speaking, the dropout voltage increases as the output current increases.

Switching frequency and behavior under light loads

The regulator generally operates at a switching frequency of around 600 kHz, but the frequency drops when encountering a light load to improve efficiency. This could make it harder to filter out noise on the output caused by switching.

The graph below shows the typical efficiency of the 3.3 V D24V25F3 regulator as a function of the output current:



Since the regulator's input voltage must be at least 4.5 V, dropout voltage is not a consideration for this 3.3 V version.
During normal operation, this product can get hot enough to burn you. Take care when handling this product or other components connected to it.

The over-current limit of the regulator operates on a combination of current and temperature: the current threshold decreases as the regulator temperature goes up. However, there might be some operating points at low input voltages and high output currents (well over 2.5 A) where the current is just under the limit and the regulator might not shut off before damage occurs. If you are using this regulator in an application where the input voltage is near the lower limit and the load could exceed 3.5A for sustained periods (more than five seconds), consider using additional protective components such as fuses or circuit breakers.