Input and output current vs input voltage for nominal current test graph

Question 1: Discuss the efficiency of the 3.3V vs. the 5V power supply for the nominal currents. Are there times when using each one makes more sense?

It appears that the 5v switching supply is more consistent across a range of input currents while the 3.3 linear supply becomes less efficient at higher current.

Question 2: Why do we test nominal current? Why not just test peak current?

Because ohmic trends may exist within the operating range that do not cause total failure but are worth considering.

Input and output current vs input voltage for peak current test

Question 1: Discuss the efficiency of the 3.3V vs. the 5V power supply for the peak currents. Plot the efficiency of each supply against the input voltage.

Both 3.3v and 5v seem to have a consistent linear relationship between input and output current vs voltage for this test.

Nominal and peak output current vs input voltage

Question 1: From your data, what conclusion can you make about when each type of supply is to be used?

The linear power supply appears to be less efficient then the switching supply. So for higher voltages and currents where efficiency is a concern the switching supply should be used. For a more stable output at lower power however, the linear supply should be used.

Output voltage ripple vs load current for at least 3 input voltages

Question 1: From your data, what conclusions can be drawn about voltage ripple vs. load current for the 5V and 3.3V supply?

The voltage ripple in response to load current seems to be higher with the 5v switching supply due to the inductor's transient response. Both voltage ripple values hover in the 1v range before abrupt total failure or a step down in voltage at higher input currents.

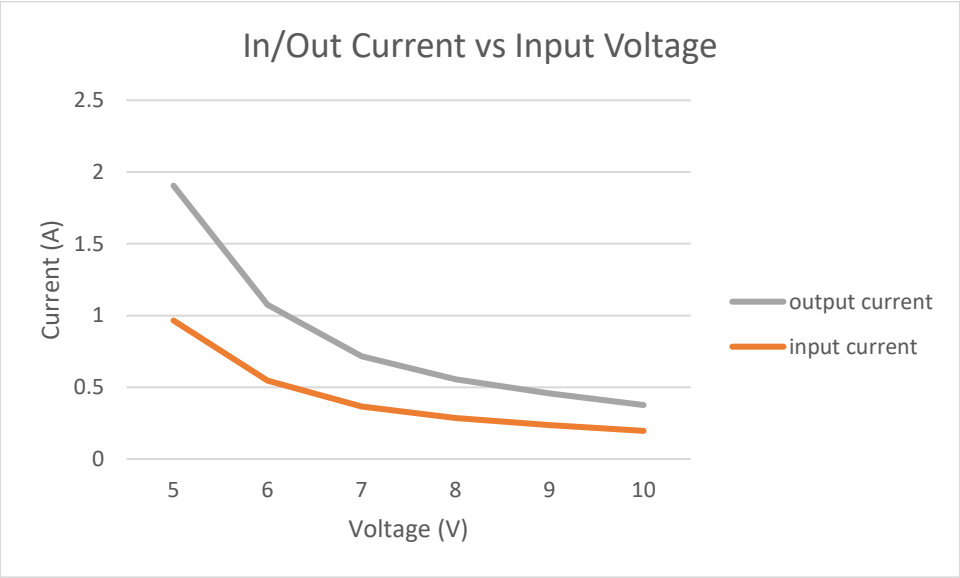

Figure 1 - 3.3v Linear supply nominal

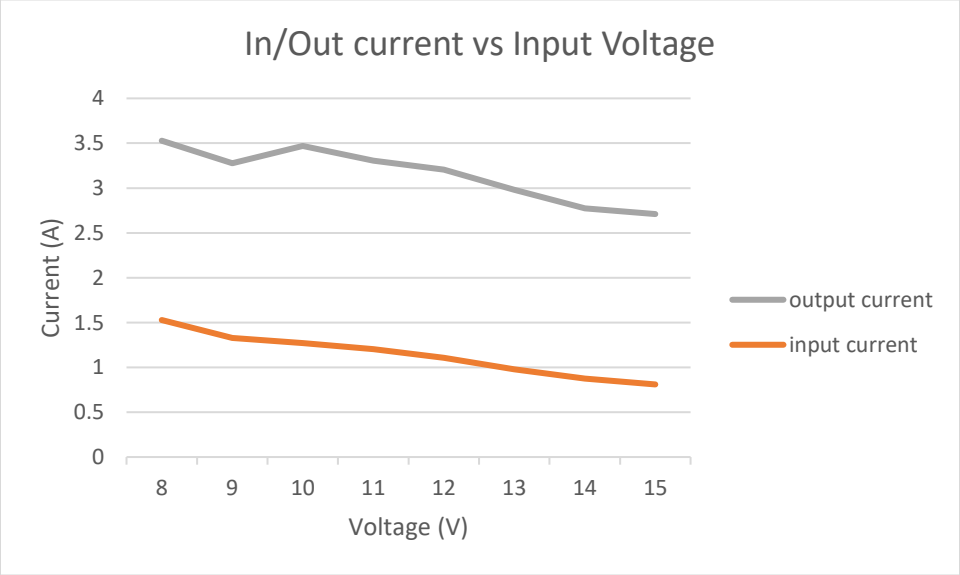

Figure 2 - 5v switching supply nominal

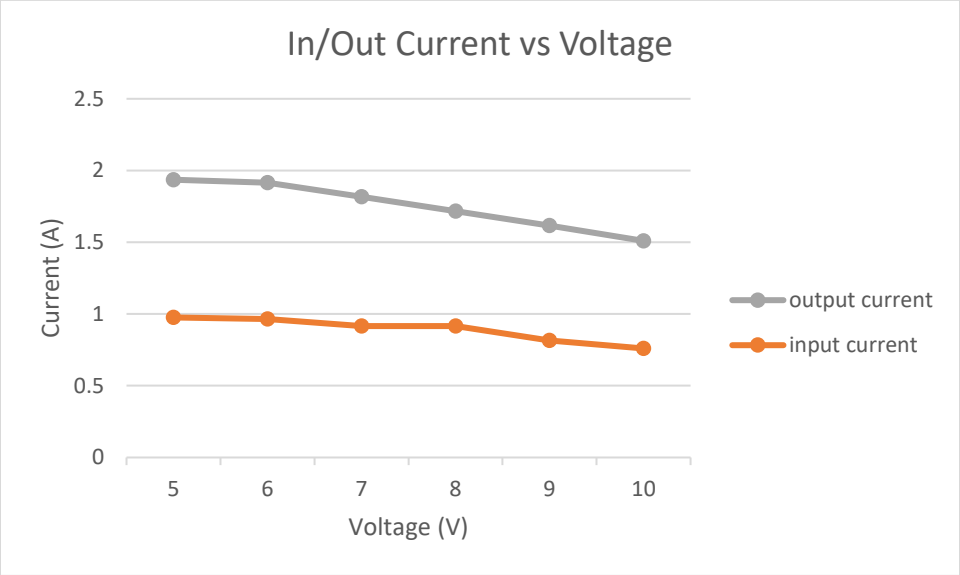

Figure 3 - 3.3v Linear Supply peak

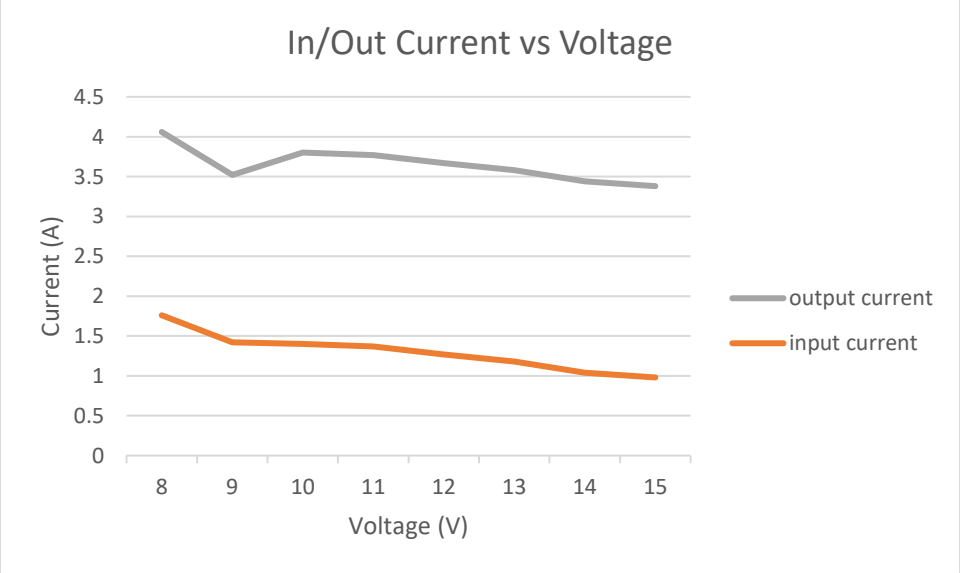

Figure 4 - 5v switching supply peak

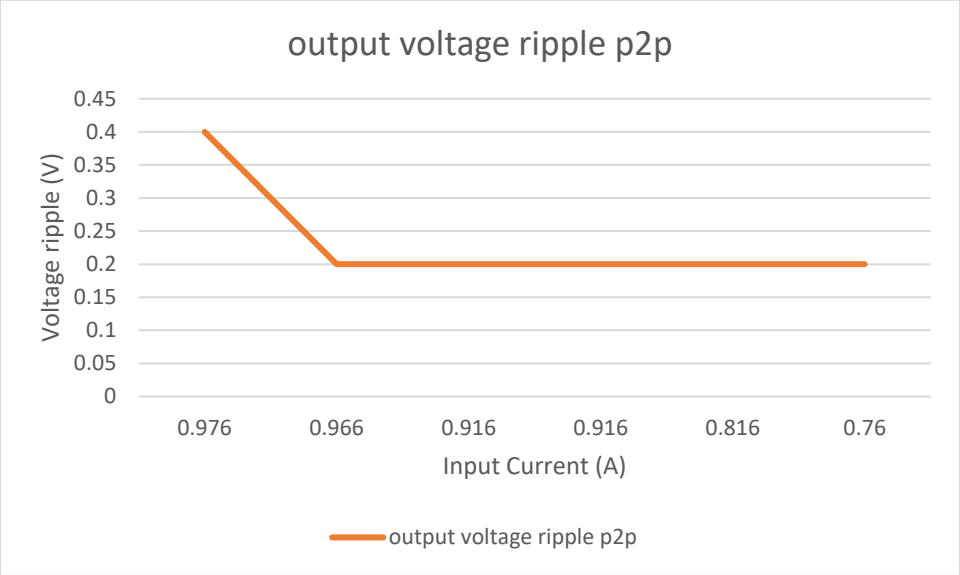

Figure 5 - Voltage ripple vs input current 3.3v linear supply

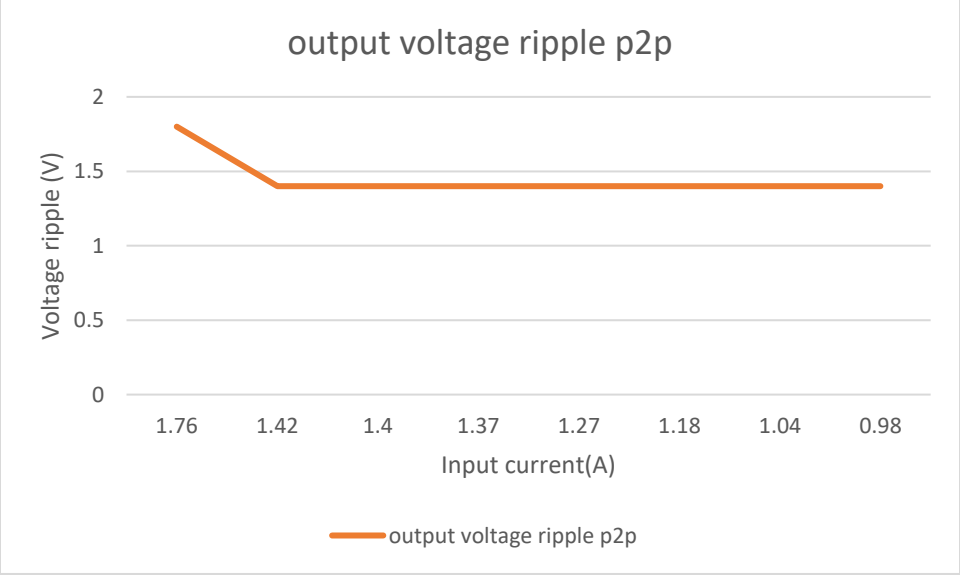

Figure 6 - Voltage ripple vs input current 5v switching supply