

We have made a suitable long core transformer capable of producing 57V DC with good regulation at 0-16A. I have also ordered some suitable capacitors.

I want to use eight or 10 FJA4313 transistors attached to the same heat-sink. Four would be mounted on the main board, and four or six would be mounted on the heatsink, and connected by appropriate resistors to the main circuit.

I set up a test rig to see if my heat-sink was big enough. I used a 17A 60V switch-mode power supply to supply the DC. I mounted four of the FJA4313 transistors on the heatsink, along with an LM317HV. I made up a breadboard circuit with a TIP32C PNP transistor (which I had) instead of the BD140 and set up the voltage in the traditional manner for the LM317, with a fixed resistor and a 10k Ω potentiometer.

My load was a 300W 1 Ω resistor. I gradually increased my current to 16A and the input voltage to 55V DC. For cooling, I used a 50W 24V server fan which kept the temperature below 45°C.

I want to put the transformer, rectifier and capacitors in a separate box, down on the floor out of the way, and feed the smoothed DC to the linear power supply. If I connect the two with 3m of 4AWG wire (21mm²), I can keep the voltage drop down to 0.1V.

Can you foresee any problems with doing this? Can the TIP32C transistor drive eight FJA4313 transistors? Will they share the load OK? I will change the shunt. Are there any other components that need to be changed? (G. M., Sockburn, NZ)

- We are concerned about the stability of the power supply given the nature of your proposed changes. That was what took the longest time to get right. In particular, a long cable run between the capacitors and transistors is likely to cause problems, in spite of the low resistance. We suggest adding some significant capacitance across the regulator end of those wires to address this.

Increasing Linear Supply voltage/current

Thank you for the circuit boards for the 45V 8A Linear Power Supply (October-December 2019; siliconchip.com.au/Series/339). I wish to upgrade the power supply to handle 50V 16A.

As you are making major changes to the output circuit, it's hard for us to speculate on what will and won't work. You may need to change some of the other components there too. We don't think load sharing will be a problem, but stability might. Having said that, your proposed changes are probably workable, provided you test it thoroughly and are prepared to tweak the circuit if necessary.

You will need to check the output over a range of voltage and load conditions with an oscilloscope to verify there is no oscillation under any conditions. Also test the sudden addition and removal of loads to ensure that this does not trigger oscillation, or result in significant voltage overshoot or undershoot.