

How To: Part Substitutions:

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After 22 years, it appears that quite a few DIY enthusiasts are still eyeing the A40 Class A amplifier design, but are discovering that not a single transistor from this design is still available. The following information is for those scouting out substitute parts:

The Lambda output devices are no longer available, and they weren't that common to begin with. Lambda appears to still be in business, but not in the business of power transistors.

Common everyday complementary power darlington transistors will substitute for these. They need to be rated at 75 watts or higher, 5 amps for higher, and 80 volts or higher.

Good examples of these are the TIP142 (NPN) and TIP147 (PNP), which are currently available from Digikey.

Another fine example, although harder to get, are the Motorola MJ11012, MJ11014, and MJ11016 (NPN) and MJ11013 and MJ11015 (PNP).

The remaining bipolar transistors MP5L01 and MP5L51 can be substituted by ordinary TO-92 devices rated at voltages of 100 volts or more, and currents of 25 mA or more. For best results the beta (current gain) of the devices should be 100 or greater. Q3, Q4, and Q5 should be fitted with heat sinks.

It is possible that the bias might be at a slightly different value with these substitutions, in which slightly altering the values of R11 or R12 will allow some adjustment. A slight increase of R11 or decrease of R12 will increase the bias, and vice versa.

The JFET in the circuit, Q11, is used as a constant current source to bias a few milliamps through D1 and D2 which provides a clean voltage reference for the constant current sources Q3 and Q4. first, note that the source pin of the Jfet is attached to R9, and there has been some confusion about that, with some different pinouts on the 2N5248.

You can substitute this part with a convention N channel JFET which has been tested to act as a current source in the circuit with R9. The value of R9 has been chosen so that the JFET passes about 3 mA or so (not critical). You can also substitute in a monolithic constant current source if you can find one, rated at about this current and 40 volts.

If you can't find any JFET for the current source, or are impatient while waiting for one to arrive, you can simply use a resistor as a poor man's current source by putting a 10 Kohm resistor where the JFET goes, connecting between R9 and ground. This will work, but is noisier than a constant current source. This can be improved with an electrolytic capacitor (say 100 uf @ 50V) between the negative rail and the junction between R9 and the 10Kohm resistor, with the positive pin of the capacitor between R9 and the 10K resistor.

So that's it. For those who keep wanting to know what the value of C4 is, read the text. C4 is an optional capacitor in the event of high frequency instability, and usually is 20 to 100 pico farads.