

Using Power Supply Mosfets in HF Power Amplifiers

In working with power supply type Mosfets two very important things have been learned. The first concerns input driving circuits while the second relates to output circuit configuration.

1. Input Circuits

Most power supply Mosfets have an input Q greater than 5 at 160 meters and should be driven with a voltage source such as squarewave driver chips or discrete npn/pnp circuits. This is because the input capacity of the Mosfet is the dominate load on the driver. An alternate method is to terminate the inputs in shunt resistance (with blocking capacitor) and drive them as resistive loads.

As the frequency increases to 40 meters the input Q decreases to well under 5 and a different approach should be used. It becomes very difficult to drive large input capacities from a voltage source so current drive (tuned transformer drive) should be used. This has been done as high as 6 meters with large Mosfets.

At 80 meters either method may be used.

Table 1 shows the input impedance and input Q of the IRFP32N50K Mosfet on some of the HF bands. At 40 meters the real part of the input impedance is about 1.13 ohms while the input reactance (in series) is 3.56 ohms. $Q = 3.56/1.13$ or 3.15. Going to 20 meters and higher the Q decreases further and transformer drive works even better and voltage drive has no chance.

