

Bias Recommendations for Hybrid Amplifiers

Unlike single transistors, most Spectrum Microwave hybrid amplifiers are complete amplifier assemblies and contain internal bias circuits. The only requirement to power up the amplifiers is the application of one power supply voltage to the Vcc pin.

The only exceptions would be special dual voltage designs and the low cost CZ series. Consult the datasheets of these special designs for bias details.

Spectrum Microwave hybrid amplifiers also contain internal bypass capacitors on the Vcc line, and in many applications this is sufficient DC supply line bypassing. With higher gain amplifiers, or multi-stage amplifier chains, it is always good RF practice to add additional bypassing outside the amplifier module on the DC supply line. This also adds additional system power supply noise rejection.

The function of a bypass capacitor is to offer a low impedance RF path to ground from the DC supply line. It is also desirable to have a resonant free broadband bypass over a wide range of frequencies. This is hard to achieve with one bypass capacitor, so good RF bypassing usually incorporates several bypass capacitors in parallel. Depending on the frequency range of the amplifier, the bypass capacitors usually span the range of picofarads to microfarads in value. A very good combination would include four capacitors, 100pF, .01uF, 0.1uF and 1uF as shown in figure 1. These capacitors should be as close as possible to the amplifier supply terminal, and should be connected directly to a good RF ground.

To prevent possible instability and oscillations, the hybrid amplifier itself must always be mounted on a good RF ground.

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The effectiveness of the bypass capacitors can be increased by inserting a series impedance in the DC supply line between the bypass capacitors and the power supply feed point. This could take the form of a low value resistor or an inductor.

On most Spectrum Microwave hybrid amplifiers there is no DC bias on the RF input or RF output terminals. Most amplifiers have internal DC coupling capacitors, but some have a low resistance transformer winding to ground. Check with Spectrum Microwave engineering before applying DC voltage to the RF input or RF output terminals, or add external DC coupling capacitors.

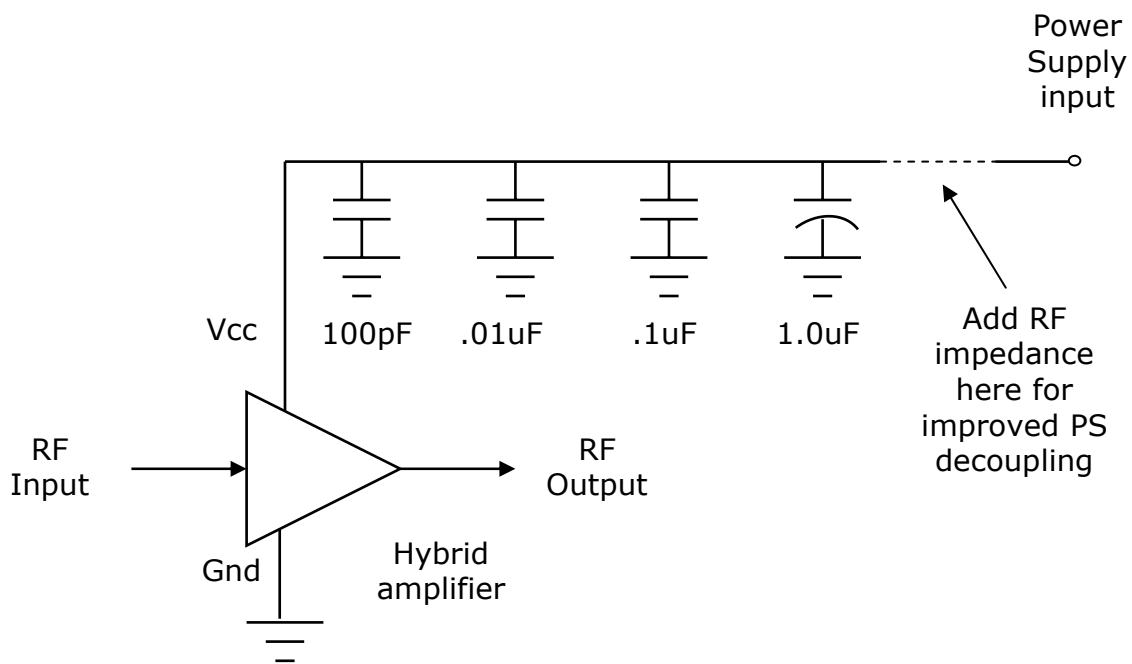


Figure 1