

The most obvious first approach to good linearity is a low-distortion device that is operating at optimum voltages and currents and is free from instabilities. Generally the high-performance BJT devices are no better or worse than comparable FET devices regarding IMD performance in a well-designed circuit. The FET outperforms the BJT in the levels of the higher-order IMD products [18]. The higher-order products decrease in level at a faster rate as one examines higher and higher-order products in an RF FET rather than a BJT.

A well-regulated collector/drain dc supply is essential to obtaining good linearity. It allows optimizing the collector-to-collector (or drain) load resistance for good efficiency and controlled current swing without going into saturation. The collector-to-collector (or drain) load impedance must be maintained as close to resistive as possible. This in turn requires optimizing the output wideband transformer(s), combiner (if used), and lowpass filter passband VSWRs to as low values as possible.

The base-/gate-bias regulator must be absolutely stable and free from RF or envelope modulation. The bias regulator for a BJT amplifier must be capable of supplying the peak current required from the lowest-gain devices anticipated in production and at the highest RF power level. Careful attention to the bias supply performance is necessary for the best linearity that the devices are capable of.