

Glossary of Control Component Terminology

1 dB compression point – As RF signal input level to a phase modulator is increased, output should follow in a linear manner. However, after a certain point, output signal level increases at a lower rate until the modulator output level becomes fairly constant. The RF input level for which the output level deviates from linearity by 1 dB is the “1 dB compression point.”

amplitude unbalance – Amplitude unbalance is a measure of the worst-case variation in insertion loss between the states in a modulator. For a demodulator, amplitude unbalance is the difference of the I and Q power. Amplitude Unbalance = $PI(dBm)-PQ(dBm)$.

attenuation – This is the amount by which the input signal is decreased when the PIN diodes are fully biased (in other words, when maximum current is drawn). It is also often termed “isolation” of a PIN switch.

carrier rejection – The amount of carrier measured in dB below the desired output signal when a coherent signal of equal amplitude and 90 degrees phase difference is applied to the I&Q ports. This is shown in **Figure 1** below. f_c & f_i are the carrier and IF (I-port/Q-port) frequencies, respectively. This also applies to biphas modulators

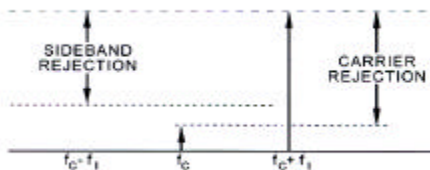


Figure 1. Carrier Rejection

conversion loss – For a modulator, conversion loss (C.L.), in dB, is defined as below:

C.L.(dB) = Input(I+Q) Power – Output RF Power of the dominant sideband.

For a demodulator, it is defined as:

C.L.(dB) = RF Input Power – (I+Q) Output Power.

harmonic suppression – In a modulator, besides the undesired sideband and carrier, harmonic products of the IF combine with

the carrier to produce undesired signals at RF as below:

$$f_c \pm n f_i$$

The most important products are the third and fifth, $f_c \pm 3f_i$ and $f_c \pm 5f_i$ since they are very close to the desired sideband and

almost impossible to filter. For a demodulator, the harmonic products of interest are $n f_i$. The products of most interest are $n = 3$ and $n = 5$.

I & Q. In-phase and quadrature-phase components of output.

insertion loss – This loss figure is the minimum amount of attenuation when the bias current is zero and the PIN diodes are off. The loss is made up of any device losses and the individual insertion losses of the circuit. The insertion loss of a phase modulator is measured statically in one of the possible states and represents the worst-case loss for any state. For QPSK modulators, the insertion loss is 6 dB typically.

phase unbalance – Phase unbalance is a measure of the offset from the desired carrier phase relative to the actual phase shift in any of the possible phase states. This is measured with respect to a reference or 0 degree phase state. The deviation from 90 degrees of the phase angle difference of the I&Q port output signals.

quadrature phase shift keying modulator – Quadrature phase shift keying (QPSK) modulators are four-port devices with RF-in, RF-out, and two data input ports. A bipolar signal is applied at data ports to produce an RF output signal phase-modulated by 0 (reference), 90, 180, or 270 degrees, depending on the state of the modulating signal.

sideband rejections - The amount of undesired sideband measured in dB below the desired sideband under the same conditions as the carrier rejection measurement. See **Figure 1**.

VSWR – VSWR is a measure of impedance match at input and output ports of the modulator. This parameter represents imperfect input and output impedances.

Glossary of Control Component Terminology

NOTE: Please click on the Product Descriptions and Datasheets button in the Products tab for more information on series **PSP** SPST PIN switches, series **PDT** SPDT PIN switches and series **PSH** high speed PIN switches for definitions and explanation of **switching speed, switch propagation delay, switching time, driver delay** and other PIN switch related terms.