

TECHNICAL DESCRIPTION / APPLICATION

The block diagram for a typical Merrimac IQZ-20J Series I&Q product is shown above. The I&Q network is composed of an in-phase power divider, two balanced mixers used as phase detectors, and a 90 degree quadrature hybrid all housed in a small SMD package. The LO signal enters the network via the hybrid and the RF signal via the power divider. After being phase detected by their respective mixers, the two resultant baseband signals exit the two mixer's IF ports and provide the I & Q outputs for the network.

The principal function of an I&Q network is to extract phase information from the incoming RF signal when compared to the reference LO signal. The phase information has many applications in navigation systems since it can ultimately provide positional data especially useful in guiding or locating fast moving vehicles such as aircraft or missiles. Ideally the I & Q output signals are equal in amplitude and 90 degrees of phase with respect to each other. Minor performance variations can occur due to component tolerances and interface mismatches. These areas are addressed during the production and alignment stages of manufacturing the product and subsequently yield the specifications detailed here in.

In digital systems the I&Q signals are easily converted to "ones and zeros" for computer processing. In analog systems such as radars, the baseband can be directly applied to the radar system's video amplifiers circuits for final signal processing.

The Merrimac IQZ-20J Series I&Q products are precision tuned to the customer's specific LO/RF frequency and provide excellent phase and amplitude balance across a 10% operating bandwidth. The use of welded, internal construction coupled with Merrimac's low cost surface mount package make the IQZ-20J Series ideal for both commercial and Military COTS applications.

PRINCIPAL SPECIFICATIONS

Model Number	LO Frequency, f_c , MHz	Video Bandwidth
IQZ-20J-174B	174	*DC to 50MHz
IQZ-20J-***B	20-1000	*DC to 50MHz

For complete Model Number replace *** with desired
 LO Center Frequency, f_c in MHz

GENERAL SPECIFICATIONS

RF/LO Input Characteristics

- RF* Bandwidth: 10% of f_c
- Impedance: 50 Ω , nom.
- VSWR: 1.5:1, max.
- RF Power Level: 0 dBm, nom.
- LO Power Level @ f_c : +10 dBm, nom.

Conversion Loss

- (RF to I or Q): 10 dB, typ., 12 dB, max.

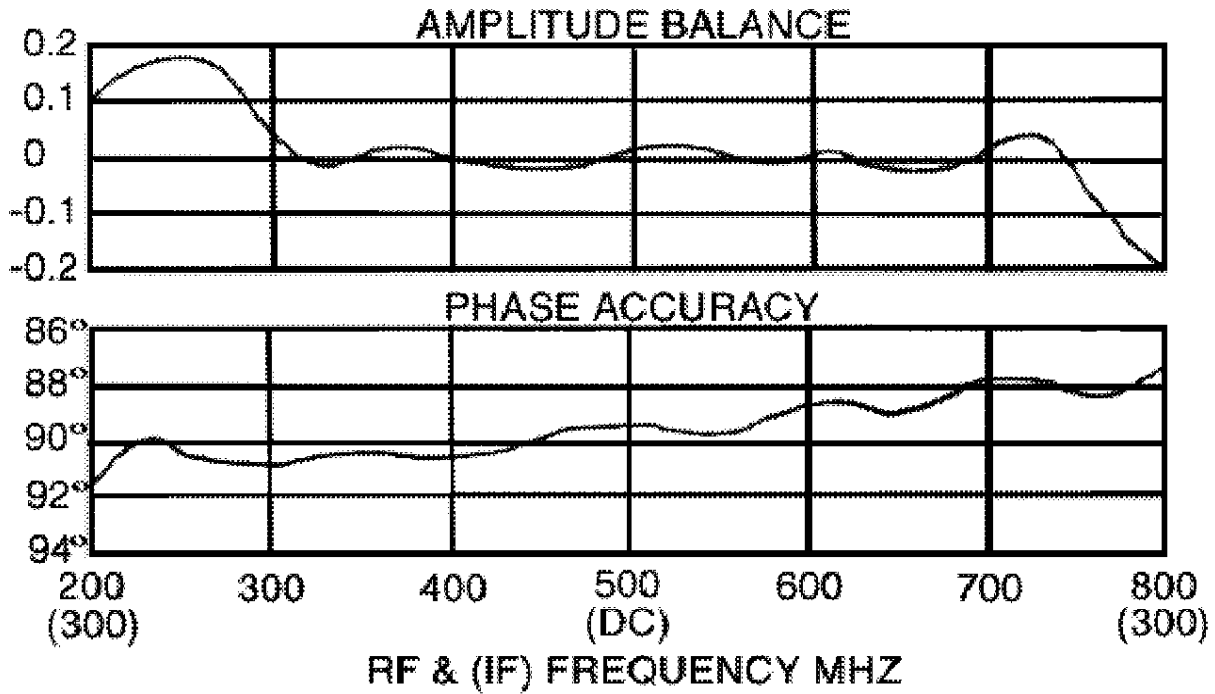
IF Quadrature Balance
 (I to Q) @ 100 kHz IF
 (LO= f_c)

- Phase: $\pm 1^\circ$ typ, $\pm 2^\circ$ max.
- Amplitude: 0.2 typ., 0.3 dB max.
- Weight, nominal: 0.6 oz (1.6 gm)
- Operating Temperature: -55° to +85°C
- Video Bandwidth: DC to 10% of f_c

*RF and Video Bandwidths are typically much greater than specified.

TYPICAL PERFORMANCE

PERFORMANCE OVER VIDEO BANDWIDTH (LO AT 500MHZ)



PACKAGE OUTLINE

