Abstracts

Wide-band MMIC Kowari mixer/phase shifters

S.J. Mahon, J.T. Harvey and A.C. Young. "Wide-band MMIC Kowari mixer/phase shifters." 2001 Transactions on Microwave Theory and Techniques 49.7 (Jul. 2001 [T-MTT]): 1229-1234.

A series of wide-band image-reject monolithic-microwave integrated-circuit mixer/phase shifters were designed, fabricated, and tested for operation in the microwave and millimeter-wave bands. Mixers based on diode and resistive-high electron-mobility transistor (HEMT) nonlinear elements are presented and compared in this paper. The diode-based Kowari mixers have a bandwidth of approximately 45%, with up- and down-conversion loss [RF to/from IF (in this paper, we use "IF," "LO," and "RF" to label the ports associated with particular signals, not necessarily to describe the nature of the signals themselves)] less than 10 dB and up-conversion output power greater than 0 dBm. At band center, the down-conversion loss is approximately 7 dB. The novel resistive-HEMT-based Kowari mixers have a measured IF-to-RF up-conversion loss of approximately 2 dB and LO-to-RF conversion loss of approximately 13 dB over 17-25.5 GHz. While both circuit types realize wide-band 360/spl deg/ phase shifters when appropriate control voltages are applied, the resistive-HEMT-based Kowari has better linearity and a smaller insertion loss.

❑ Return to main document.