# Abstracts

## A monolithic even harmonic quadrature mixer using a balance type 90 degree phase shifter for direct conversion receivers (1998 Vol. I [MWSYM])

*M. Shimozawa, K. Kawakami, H. Ikematsu, K. Itoh, N. Kasai, Y. Sota and O. Ishida. "A monolithic even harmonic quadrature mixer using a balance type 90 degree phase shifter for direct conversion receivers (1998 Vol. I [MWSYM])." 1998 MTT-S International Microwave Symposium Digest 98.1 (1998 Vol. I [MWSYM]): 175-178.*

This paper proposes a novel circuit configuration of an even harmonic quadrature mixer (EHQMIX) for direct conversion receivers. In this EHQMIX, a 90 degree phase shifter consists of balance type high pass and low pass filters, and it does not require any circuits connecting to the ground plane. So this configuration is suitable for low cost monolithic IC implementation without any via-holes, because amplitude and phase imbalance, caused by the inductance included in the wires and leads of a package, can be reduced for circuits connected to the ground plane. A developed L-band MMIC achieves good quadrature detection characteristics.

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