Abstracts

Millimeter wave direct quadrature converter integrated with antenna for broad-band wireless communications

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A compact quadrature modulator/demodulator integrated with a 40 GHz patch antenna for millimeter wave wireless applications is proposed. Anti-parallel diode sub-harmonic mixers are constructed for broad-band direct quadrature conversion. Overall phase and amplitude imbalance between the mixer I and Q output channels are less than 1.2/spl deg/ and 1 dB respectively. An average conversion loss of mixers of -14.6 dB is achieved in the frequency range from 39.75 GHz to 40.25 GHz. A communication link is built based on a pair of the proposed front-ends. Data transmission at up to 1 Gb/s data rate for QPSK modulation is successfully demonstrated.

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