Abstracts

An asymmetric GaAs MMIC dual-gate mixer with improved intermodulation characteristics

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An MMIC single-ended mixer with improved intermodulation characteristics has been developed by using a novel approach of combining two FETs with different gate width in a cascode connection. The fabricated circuit operating at the PCS (personal communication system) frequency band of 1.855 GHz shows a conversion gain of 5 dB at an LO power of 0 dBm and LO to RF isolation over 25 dB in a condition of low power consumption (V/sub DD/=3 V, I/sub ds/=5.5 mA). The measured 3/sup rd/ order intermodulation distortion without IF output matching is -44 dBc at the RF power of -20 dBm, which shows the improvement by 20 dB compared to that obtained from the conventional symmetric dual-gate mixer realized by cascode connection of two FETs with same gate width. A complete harmonic balance simulation has been performed to explain the improvement in the intermodulation characteristics.

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