Abstracts

Integrated Balanced BPSK and QPSK Modulators for the Ka-Band

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Microwave integrated circuit (MIC) balanced biphase-shift-keying (BPSK) and quadri-phase-shift-keying (QPSK) modulators have been achieved in the 27-GHz band. The modulators are fabricated using a combination of microstrip lines and slot lines, viz., tow-sided MIC. The diodes used are beam-lean Schottky-barrier diodes. Balanced BPSK modulation is performed by path-switching and mode transformation from the slot line to microstrip lines. The insertion loss is 2.2 dB at a carrier frequency of 27 GHz. The phase error and the amplitude deviation are less than 1° and 0.5 dB, respectively. The QPSK modulator consists of two BPSK modulators, a power divider, and a branch-line hybrid coupler. The configuration of the modulator is the parallel-connected type. The insertion loss is 6.3 dB at a carrier frequency of 27 GHz. The phase error is less than 2°, and the rise time and fall time of the modulated earner are less than 300 ps. The isolation between the carrier input port and the QPSK modulated earner output port is greater than 25 dB. These modulators can be extended to the millimeter-wave band.

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