Abstracts

A W-Band Single-Chip Transceiver for FMCW Radar

K.W. Chang, G.S. Dow, H. Wang, T.H. Chen, K. Tan, B. Allen, J. Berenz, J. Wehling and R. Lin. "A W-Band Single-Chip Transceiver for FMCW Radar." 1993 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 93.1 (1993 [MCS]): 41-44.

This paper reports a W-band transceiver implemented on a single-chip MMIC. The MMIC chip contains a W-band VCO, transmit amplifiers, a receiver low noise amplifier and a mixer. It is used as the front-end of a homodyne FMCW radar for target range and range rate sensing applications. The 6.9 X 3.6 mm^2 monolithic chip was fabricated using 0.1 µm pseudomorphic InGaAs/AlGaAs/GaAs HEMT process technology. The transmitter output power is more than 10 dBm for frequencies between 90-94 GHz and maximum tuning bandwidth is 500 MHz for the VCO. The receiver channel has 6 dB conversion gain when the output transmitting power is 10 dBm. A complete radar system has been tested based on the single-chip MMIC front-end. The calculated range and range rate are in good agreement with the measurement data.

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