Abstracts

A 94 GHz single-chip FMCW radar module for commercial sensor applications

A. Tessmann, S. Kudszus, T. Feltgen, M. Riessle, C. Sklarczyk and W.H. Haydl. "A 94 GHz single-chip FMCW radar module for commercial sensor applications." 2002 MTT-S International Microwave Symposium Digest 02.3 (2002 Vol. III [MWSYM]): 1851-1854 vol.3.

A single-chip 94 GHz frequency modulated continuous wave (FMCW) radar module has been developed for high resolution sensing under adverse conditions and environments. The monolithic microwave integrated circuit (MMIC) includes a varactor tuned VCO with injection port, very compact transmit and receive amplifiers and a single-ended resistive mixer. To enable bidirectional operation of a single transmit-receive antenna a combination of a Wilkinson divider and a Lange coupler was integrated. The circuit features coplanar technology and cascode HEMTs for compact size and low cost. These techniques result in a particularly small over-all chip-size of only 2/spl times/3 mm/sup 2/. The packaged 94 GHz FMCW radar sensor achieved a tuning range of 6 GHz, an output power of 1 mW and a conversion loss of 5 dB. The RF performance of the radar module was successfully verified by real-time monitoring the time flow of a gas-assisted injection molding process.

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