Abstracts

A 1-chip RF transceiver MMIC for ETC with surface via-hole isolation technique

S. Yamamoto, A. Suwa, T. Tanbo, T. Kitazawa, K. Tara and M. Hagio. "A 1-chip RF transceiver MMIC for ETC with surface via-hole isolation technique." 2001 Radio Frequency Integrated Circuits (RFIC) Symposium 01. (2001 [RFIC]): 195-198.

An RF Transmitter Receiver MMIC (TX-RX MMIC) with 16-pin plastic package has been developed for 5.8 GHz Japanese Electronic Toll Collection system (ETC). The MMIC contains following RF blocks; local buffer amplifier, variable attenuator, ASK modulator, power amplifier, low-noise amplifier, down-converter, local switch and antenna switch. We have developed the new Surface Via-Hole (SVH) isolation technique to integrate all RF circuits into single chip. The double hetero-junction modulation doped FETs (MODFETs) and SrTiO/sub 3/ (STO) MIM capacitors are also developed to realize a single voltage operation and small chip size. By using SVH isolation technique, low carrier leakage of -43 dBm, high on/off ratio of 39.6 dB at 5.84 GHz and low total current of 150 mA are achieved, and the practical small chip size (2.25/spl times/1.25 mm/sup 2/) is realized.

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