Abstracts

Compact LNA and VCO 3-D MMICs using commercial GaAs PHEMT technology for V-band single-chip TRX MMIC

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This paper presents compact V-band low-noise amplifier (LNA) and Ka-band voltage-control oscillator (VCO) 3-D MMICs for a V-band highly-integrated single-chip transceiver MMIC. 3-D MMICs are fabricated through the cooperation of commercial foundry GaAs pHEMT and 3-D interconnection processes. The LNA (chip size is 0.75 mm/sup 2/) achieves 15 dB gain and better than 3.3 dB noise figure from 50 GHz to 60 GHz. The VCO (chip size of 0.52 mm) achieves 11.5 dBm output power, 3.8 GHz oscillation frequency tuning range, and a phase noise of -102 dBc/Hz at 1 MHz offset and 28.6 GHz output signal. The cooperation 3-D MMIC technology with a high-performance commercial foundry technology promises low-cost, compact, and high performance millimeter-wave MMICs.

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