Abstracts

A Ku band InGaP/GaAs HBT MMIC VCO with a balanced and a differential topologies

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Two fully integrated voltage controlled oscillators (VCO) with low phase noise are presented. The VCOs are realized on a commercially available InGaP/GaAs heterojunction bipolar transistor (HBT) technology with an f/sub T/ of 30 GHz. The circuits are based on the balanced common base Colpitts topology and the capacitively coupled differential topology. To improve the quality factor of the LC tank, a 70-ohm microstrip line is incorporated as an inductor with a varactor. The balanced VCO provides single ended output power of 0 dBm and a phase noise of -90.5 dBc/Hz at 100 kHz offset from a carrier frequency 13.5 GHz. The differential VCO has single ended output power of -1.5 dBm and -88 dBc/Hz at 100 kHz offset from a carrier frequency of 12.2 GHz. The balanced and the differential VCOs achieve very low FOMs of -180.7 and -177.6 dBc/Hz, respectively.

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