Abstracts

An analogue frequency-division approach for subharmonic generation in microwave VCOs

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An effective and simple technique for frequency division is introduced to generate subharmonic signal in wireless VCO circuits, thus eliminating the need for expensive digital prescalers. In this approach, frequency division is realised by injection locking an RC oscillator (multivibrator) at microwave frequencies. This technique is compact efficient and MMIC compatible. The feasibility of this approach was demonstrated using a GaAs HBT RC oscillator driven by a HBT MMIC VCO operating at 4 GHz. The RC oscillator can be effectively injection locked without observable additive phase-noise degradation and generates a subharmonic clock signal at 250 MHz, corresponding to a division ratio (N) of 16. The division ratio can be varied by changing the frequency of the RC oscillator. Nonlinear simulation results and analysis are also presented to explain the operating mechanism.

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