Abstracts

A Quenchable GaAs HBT X-Band VCO for Switched Band Synthesizer Architectures

K.W. Kobayashi, D.M. Smith, C.P. Kau, A.K. Oki, A.K. Sharma, B.R. Allen and D.C. Streit. "A Quenchable GaAs HBT X-Band VCO for Switched Band Synthesizer Architectures." 1996 Microwave and Millimeter-Wave Monolithic Circuits Symposium Digest 98. (1996 [MCS]): 107-110.

Here we have achieved the lowest phase noise reported for an HBT VCO at X-band. The VCO employs an off-chip quarter-wave open stub microstrip resonator fabricated on a 50 mil quartz substrate and a shunt-varactor diode for frequency tuning. At a center frequency of 8.9 GHz, the VCO achieves -103 to -105 dBc/Hz at 100 KHz over a tuning bandwidth of 140 MHz (1.6%). By reducing the unloaded Q of the microstrip resonator, a 770 MHz tuning bandwidth (8.6%) can be achieve with a phase noise ranging from -98.5 to -100.5 dBc/Hz. Without a tuning varactor, a record minimum phase noise of -112 dBc/Hz was achieved at a center frequency of 8.3 GHz which benchmarks the lowest reported phase noise achieved for an HBT oscillator at X-band. The HBT VCO MMIC features a monolithically integrated PIN diode quench circuit which enables the VCO to be used in switch-band synthesizer applications.

❑ Return to main document.