

## A 20-GHz InP-HBT voltage-controlled oscillator with wide frequency tuning range

---

*H. Djahanshahi, N. Saniei, S.P. Voinigescu, M.C. Maliepaard and C.A.T. Salama. "A 20-GHz InP-HBT voltage-controlled oscillator with wide frequency tuning range." 2001 Transactions on Microwave Theory and Techniques 49.9 (Sep. 2001 [T-MTT] (Mini-Special Issue on the 2001 IEEE Radio Frequency Integrated Circuit (RFIC) Symposium)): 1566-1572.*

This paper presents the design and implementation of a 20-GHz-band differential voltage-controlled oscillator (VCO) using InP heterojunction-bipolar-transistor process technology. Aimed at 20- or 40-Gb/s fiber-optic applications, the design is based on a single-stage feedback amplifier with no intentional L or C. The salient features of the proposed VCO are wide frequency tuning range compared to LC oscillators, and low power consumption and transistor count compared to ring-oscillator counterparts. The implemented VCO has an adjustable frequency range from 13.75 to 21.5 GHz and provides two complementary outputs. Total power consumption at 18.6 GHz is 130 mW, while the phase noise is -90.0 dBc/Hz measured at 1-MHz offset frequency.

 [Return to main document.](#)