Abstracts

Low phase-noise PHEMT-based MMIC VCOs for LMDS applications

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This paper presents Pseudomorphic High Electron-Mobility Transistor based K-band voltage-controlled oscillators, which have exhibited low phase-noise properties in conjunction with output powers greater than previously reported. An appropriate nonlinear design methodology based on the optimization of transistor's load cycles was applied. A tuning range over 14% bandwidth (22.4-25.8 GHz) for the first one, and 12% bandwidth (27.8-31.5 GHz) for the second one, were obtained. Constant output power of 6 dBm and 10 dBm respectively were measured over the tuning range. Markedly low phase noise level of -89 dBc/Hz at 100 kHz offset from the carrier (24.4 GHz), and -78 dBc/Hz at 100 kHz offset from the carrier (30 GHz) were achieved. To our knowledge, these are one of the best characteristics reported for K-band solid state VCOs.

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