

## 26 GHz 宽带低噪声 CMOS LC-VCO 设计

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**摘 要:** 基于 90 nm CMOS 工艺, 设计实现了一种谐振频率为 26 GHz 的低噪声宽调谐范围的 LC 压控振荡器. 分析了相邻 MOM 电容间的寄生电容并计入整体电容阵列当中, 提高了谐振网络的品质因数, 同时缩减了面积. 分析了压控振荡器的相位噪声, 采用了大尺寸尾电流管并覆盖大面积偏置滤波网络结构对相位噪声进行优化. 经过测试验证, 压控振荡器的谐振频率范围为 24.2~29.6 GHz. 当谐振频率为 26 GHz 时, 在 1 MHz 频偏处相位噪声为 -97.4 dBc/Hz, 电路功耗为 9.6 mW, FoMT 值为 -182.5.

**关键词:** LC 压控振荡器; 谐振频率; 相位噪声

## A 26 GHz wideband low phase-noise CMOS LC VCO

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**Abstract:** Based on the 90nm CMOS process, a low noise wide tuning range LC voltage controlled oscillator with a resonant frequency of 26 GHz is designed. The parasitic capacitance between adjacent MOM capacitors is analyzed and included in the overall capacitor array, which improves the quality factor of the resonant network and reduces the area. The phase noise of the voltage controlled oscillator is analyzed, and it was optimized by using a large-sized tail current transistor and covering a large area bias filter network structure. The test results showed that the oscillation frequency covered 24.2~29.6 GHz, the phase noise reached -97.4 dBc/Hz at 1 MHz offset from a 26 GHz carrier with a power consumption of 9.6 mW, and the FOMT value of -182.5 dBc/Hz.

**Key words:** LC voltage-controlled oscillator; resonant frequency; phase noise

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