Abstracts

Microwave MEMS-based voltage-controlled oscillators

A. Dec and K. Suyama. "Microwave MEMS-based voltage-controlled oscillators." 2000 Transactions on Microwave Theory and Techniques 48.11 (Nov. 2000, Part I [T-MTT] (Mini-Special Issue on RF/Microwave Applications in Medicine)): 1943-1949.

A microwave voltage-controlled oscillator (VCO) based on coupled bonding wire inductors and microelectromechanical system (MEMS)-based variable capacitors for frequency tuning is demonstrated in this paper. The MEMS-based variable capacitors were fabricated in a standard polysilicon surface micromachining technology. The variable capacitors have a nominal capacitance of 1.4 pF and have a Q factor of 23 at 1 GHz and 14 at 2 GHz. The capacitance is variable from 1.4 to 1.9 pF as the tuning voltage is swept from 0 to 5 V. The VCO, fabricated in a 0.5 /spl mu/m CMOS technology, was assembled in a ceramic package where MEMS and CMOS dice were bonded together. The oscillator operates at 2.4 GHz, achieves a phase noise of -122 dBc/Hz at 1 MHz offset from the carrier, and exhibits a tuning range of 3.4%.

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