Abstracts

Monolithic Narrow-Band Filter Using Ultrahigh-Q Tunable Active Inductors

S. Lucyszyn and I.D. Robertson. "Monolithic Narrow-Band Filter Using Ultrahigh-Q Tunable Active Inductors." 1994 Transactions on Microwave Theory and Techniques 42.12 (Dec. 1994, Part II [T-MTT] (1994 Symposium Issue)): 2617-2622.

A tunable active inductor is presented where the novel topology enables both the inductance and series resistance to be varied. With a discrete MMIC realization of this active inductor, Q-factors in excess of 15000 have been measured over a wide range of inductance values. Applications for these active inductors include high-performance narrow-band filters, voltage controlled oscillators, and analog phase shifters. Analytical equations for the novel active inductor and a 3-resonator filter are given. The measured performance for a monolithic 2 GHz filter achieves a mean insertion loss of 0.9 dB, passband ripple of ±0.7 dB, with a 3 dB bandwidth of 70 MHz, and an excellent out-of-band rejection which exceeds 50 dB up to 18 GHz.

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